Cumulative Socioeconomic Monitoring:

Issues and Indicators for the Beaufort Region

March 1984

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Government of the
Northwest Territories

The Department of Indian Affairs
and Northern Development

CUMULATIVE SOCIOECONOMIC MONITORING:

ISSUES AND INDICATORS FOR CANADA'S BEAUFORT REGION

prepared for

Energy, Mines and Resources
Secretariat
Government of the Northwest
Territories

The Northern Economic
Planning Branch
Department of Indian
Affairs and Northern
Development

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The views expressed in this report are those of the Consultant and do not necessarily represent the positions of the Government of the Northwest Territories or the Department of Indian Affairs and Northern Development.

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2 March 1984

Mr. Al Zariwny, Director
Energy, Mines and Resources Secretariat
Government of the Northwest Territories
4th Floor, Lang Building
Yellowknife, N.W.T. X1A 2L9

Dear Mr. Zariwny:

Please find enclosed the final version of my report, Cumulative Socioeconomic Monitoring: Issues and Indicators for the Beaufort Region. The acknowledgements in the preface contain a list of those people who were kind enough to provide a review of the earlier draft. I hope these people will receive a copy of this final report, once publication or reproduction plans are complete.

I have enjoyed working on this research project with you, and I hope you find the results helpful in your future monitoring activities.

I will be pleased to provide whatever follow-up advice and assistance you may require. Please be advised that beginning later this spring I will be working on a research project for an indefinite time period in London, U.K. However, you should not hesitate to write me there if you have any queries, and I will be returning to Canada at regular intervals. My address in London after May 20, 1984 will be: Policy Studies Institute, 1-2 Castle Lane, London, SW1E 6OR, U.K. Finally, Bill Rees says that he would be happy to offer whatever assistance he might provide on behalf of the School of Community and Regional Planning.

Again, thank you for your continuing good advice on this project.

Yours sincerely,

Michael Carley

cc: William E. Rees
enc.

PREFACE

This report is the result of research on cumulative monitoring, funded equally and jointly by the Northern Economic Planning Branch of the Department of Indian Affairs and Northern Development, and the Energy, Mines, and Resources Secretariat of the Government of the Northwest Territories. The project coordinators for those agencies are Robert Sterling and Al Zariwny, respectively. Additional funding for the project was provided by the Donner Canadian Foundation. This project represents the three funding agencies' mutual concern for understanding social, cultural, and economic change in Canada's Arctic regions.

The research has been carried out by Michael J. Carley, a Ph.D. candidate and research associate, on behalf of the School of Community and Regional Planning at the University of British Columbia. Project advisor is Professor William Rees, who also assisted with the fieldwork in the Beaufort Region.

THE TASK

The obvious task was to develop a cumulative socioeconomic monitoring program for the Beaufort region. But there were three key constraints. First, this monitoring program was to be designed as a prototype for other possible monitoring efforts in the NWT. Second, the monitoring program was to be relatively easy to implement and cost-effective. Third, and perhaps most important, the monitoring program was to be policy-oriented, that is, to be concerned with the parameters of practical decision making.

These constraints ruled out a number of approaches, including academic or theoretical approaches, and ones which relied heavily on subjective social indicators. Although there is much interesting work being done on these subjective social indicators, they tend to be methodologically problematical, expensive to obtain, and difficult to interpret. The cost-effectiveness constraint ruled out research directions which would have required massive survey research programs to implement. And the policy orientation suggested that it was important that this report be readily understandable to the non-academic, and the non-social scientist. My theoretical perspectives on policy analysis and socioeconomic measurement are available elsewhere for the interested reader (Carley 1980 and 1981).

ACKNOWLEDGEMENTS

The following individuals kindly gave a detailed review to all or part of a draft version of this report. Many of their comments and suggestions were incorporated into this final version. These helpful people were, in Inuvik: Wayne Greenall (GNWT Inuvik Region), Doug Durst (GNWT Social Services), Charles McGee and Marilyn Davidson (GNWT Local Government) Rudy Cockney (Indian and Northern Affairs), and Tom Detlor (Town of Inuvik); in Yellowknife: Gilles Patenaude (Indian and Northern Affairs), Paul Berthelet (Regional Industrial Expansion), Lorne Matthews and Gay Kennedy (GNWT Energy, Mines and Resources Secretariat), Ralph Joyce and Nunda Rao (GNWT Bureau of Statistics), Sheldon Nider (GNWT Social

Services), Elaine Berthelet and Peter Owen (GNWT Health), Robin Bricel (GNWT Economic Development and Tourism), Brian Render (GNWT Local Government), Staff Sgt. Jim Scott (RCMP), Hal Logsden (NWT Housing Corporation) and Horace Crozier (Canada Employment and Immigration Commission); in Calgary: John Parkins (Regional Industrial Expansion); in Ottawa: Robert Sterling and Helga Stefansson (Indian and Northern Affairs); and elsewhere, William Rees (UBC), John Stager (UBC), Andrew Thompson (Westwater Research Centre), and Robert Bone (University of Saskatchewan). Finally, the manuscript was prepared by Bonnie Schoenberger, Michelle McCaughran and Jane Duke of the School of Community and Regional Planning at U.B.C. The assistance of all these people is greatly appreciated.

Michael Carley
Vancouver, 1984

PART I: INTRODUCTION TO CUMULATIVE MONITORING FOR THE BEAUFORT REGION

1. INTRODUCTION: WHY BE CONCERNED ABOUT MONITORING?

The likelihood of increased oil and gas development and production in the Beaufort Region will be accompanied by profound changes in many aspects of northern life.[1] The scenarios for such developments include more drilling and production platforms, more artificial islands, marine terminals, staging areas, shore-based processing facilities, coastal roads, and various delivery schemes including ice-breaking tankers, pipelines, or both. The situation is compounded by participation by three major companies, and many smaller ones. If current schemes go ahead there will soon be major changes in the character of Beaufort operations as exploration shifts to a combined exploration - development-production mode. The number of developments will expand, the labour force will grow very rapidly, and operations will become year-round. As the three major proponents said in 1981 (Dome et al.):

> Major changes are projected in the character of Beaufort operations. There would be a shift from purely exploration to a mixture of exploration, development and production. Some operations which are now distinctly seasonal would become largely or entirely year-round. Both exploration and production would move further offshore. Most importantly from a socio-economic point-of-view, there would be a large increase in the scale of operations.

Cumulative regional impacts will be intensified by various other developments, both related and independent. These may

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[1] This report focusses on the communities of the Mackenzie Delta: Toytoyaktuk, Inuvik, Aklavik, Fort McPherson and Arctic Red River. The Beaufort Region would probably logically include: Sacks Harbour, Paulatuk, Holman, and Coppermine.

include: the Norman Wells oilfield and pipeline development, extension to the Mackenzie Valley pipeline, a Dempster Pipeline, greatly increased haulage traffic on the Dempster Highway, and others. These devlopments may in turn spawn commercial businesses, shipping, transport, tourism, hydroelectric generation, etc. The population of some communities will increase considerably, especially Inuvik. In short, the landscape may change from a few communities in the wilderness to one of numerous interspaced resource extractive and supporting industries, with attendant growth in existing or new towns, linked by roads, pipelines, and new shipping and air routes.

Of course, there is also a great amount of social and cultural change occurring in the region that has little to do with oil and gas, and that really began about the 1950s: urbanization, increasing enrolment in the formal educational system, exposure to mass media and especially TV, native land claims, welfare payments, health care, roads, snowmobiles, liquor stores, and many others, which will be explored during the course of this report. But the oil and gas development and production, which represent a threshold in the industrialization of the north, forces Canadians to confront critically the many issues of concern in the region. These issues are rooted in a basic debate between the course of northern development and the control of the development process. As Environment Canada (1983, p. 3) puts it:

> This debate is not new; indeed, it is a part of our northern heritage. Recently, however, the debate has taken on a sense of urgency. This has occurred because over the last four decades, industrial man has finally developed

> the capacity to make major penetrations into the North -- penetrations that are generating sweeping change in all aspects of northern life.

Many people and groups recognise that such sweeping change should be carefully monitored to give early warning of unexpected or cumulative changes, and to promote benefits to northern people. Community and native groups, and various government departments, have stressed recently the importance of such monitoring in their submissions to the Beaufort Sea Environment Assessment panel. The Environmental Impact Statement guidelines asked the major proponents to propose a monitoring program, and the proponents' monitoring proposals are complete.

The two senior levels of government for the Beaufort region also have a keen interest in monitoring. The Department of Indian Affairs and Northern Development (DIAND) has an interest in monitoring which reflects their concern for native social development, northern economic development, and their mandate to coordinate federal activities in the two territories. The Government of the Northwest Territories (GNWT) is concerned to monitor significant and relevant changes and trends associated with resource developments, and to assess the early influence of these changes on the GNWT's expanding provision of social services.

This report is the result of research jointly and equally funded by the Northern Economic Planning Branch of DIAND and the Energy, Mines, and Resources Secretariat of the GNWT. It reflects their mutual concern for understanding cumulative social, economic, and cultural change in regions undergoing rapid resource development. The purpose of this study has been

to develop a framework for monitoring cumulative change in the Beaufort Region. But although that region is the specific focus of the research, the results are applicable in other areas of Canada as well.

The report addresses two related questions. First, what would constitute a realistic, effective socioeconomic monitoring program for the Beaufort region? Second, how would such monitoring best be undertaken, that is, what are the organizational and data problems which would have to be overcome for effective monitoring to take place? In answering the first question, the study began by identifying the important issues confronting the region and its people, and then went on to look at ways of structuring a monitoring program which hopefully enlighten us on the issues and contribute to informed debate over the measurement of change. In addressing the second question, the report looks at the necessary institutional prerequisites for good monitoring, compares these with the current institutional and jurisdictional situation, and tries to suggest a simple way of getting a monitoring program underway without too much fuss. It is hoped that the report will make some contribution to our knowledge of impact monitoring in general, as well as to the beneficial social development of the Beaufort region.

2. WHY TAKE A CUMULATIVE PERSPECTIVE ON NORTHERN DEVELOPMENT?

Before going on to look at different kinds of monitoring, and their relationship to planning and policy making, it is useful to consider more generally some of the arguments for taking a cumulative perspective on northern development, and why such a perspective is uncommon in the impact assessment process.

The zoologist McTaggart-Cowan (1976) was one of the first to suggest the necessity for a cumulative perspective, later recommended to the government as a minimum assessment condition by the Alaska Highway Pipeline Panel (1979a, p. 77). Their major recommendation read:

> The government of Canada, with the authority to approve oil and gas development, must also accept its responsibility to see that impacts are managed...it must consider the cumulative effects arising from all development activities, and provide an effective management system to avoid severe and unnecessary damage to the environment.

The cumulative perspective for the human environment considers the social, economic, cultural and political implications of all industrializing projects in the Beaufort region, with attention to their interrelated effects over time. The sum of these interrelated effects is likely to be greater than those generated by particular projects, considered separately. That is, impacts may have an additive effect: many small, local impacts could be serious when occurring together. At issue are not individual projects whose impacts may be unexceptional, but rather changes wrought by the industrializing process itself. As the Alaska Highway Pipeline Panel recognised, such a cumulative approach is essential to an understanding of

the implications of industrialization on the whole of northern life and culture itself, and is not substituted for by attention to particular effects (e.g., native employment) of particular projects, as important as those might be. However, the cumulative perspective is not easy either to conceptualize or to carry out, and in spite of the millions of dollars spent on "impact assessment", there is as yet little experience of cumulative monitoring.

There are at least five broad problem areas related to a cumulative perspective on change in the Beaufort region. These have to do with (i) the geographic scale of more "traditional" impact assessment, (ii) the timing of the assessment process, (iii) the difficulty of measuring intangible impacts, (iv) the structural organization of the impact assessment program, and (v) the need to establish the significance of research.

First, past impact assessments have been almost always project-oriented. Since, in these circumstances, there can be no consideration of cumulative impacts, this approach is automatically problematic given the enormous scale of Beaufort Sea developments, which encompass numerous interrelated sub-projects whose aggregate impact will in itself be regional in scope. The entire landscape will change from essentially wilderness to one of numerous resource extraction and heavy industrial faciltiies, connected by a network of transport and communication-related infrastructure. In the context of the relatively pristine northern environment, the cumulative impacts of such development will impose unalterable changes on existing communities and local lifestyle.

So a collection of project-oriented assessments will be of only partial help in assessing cumulative inpacts. Only a different, regional perspective can begin to help us appreciate the interrelated effects of such extensive development. Such impacts may be direct and immediate, or the impacts may be longer-term and result from incremental, additive changes in northern life.

A second problem has to do with duration and timing of typical impact assessment procedures, which concentrate a lot of resources on the pre-project phases and may often terminate before project construction commences. There has been little monitoring of construction and operating phases--indeed there is little motivation for resource developers or sponsoring agencies to undertake such monitoring once project approval is granted. Ideally, such monitoring would have to begin early in the resource exploration process and continue through the development and into the operating phase of the various resource projects. It is important to remember that while traditional impact assessment generally involves a large expenditure of resources over a short time, cumulative assessment may require expenditure stretched over a number of years. Government and/or industry may have to assume this cost.

A third problem concerns the intangible, or difficult-to-measure, impacts of resource developments on local communities and their lifestyles. The fact is that in most impact assessments, there is a tendency for hard, quantified information to obscure these intangible but important cultural and value-related impacts. Impacts normally quantified in a

socioeconomic impact assessment (for example, changes in levels of service provision, employment and income multiplier effects, in-migration of labour, taxation changes, and impacts of infrastructure) are important, but there may be other crucial impacts which have an irreversible effect on local lifestyle. For native people, these may be impacts resulting from a rapid decrease in physical and psychological isolation from non-native society. This may result in changes in the native relationship to land, curtailing of traditional gathering activities like trapping, hunting, and fishing, diminishing native language capability, changing role of elders, the effects of a moneyed economy, and other changes in sociocultural and political values, which are not easily quantified.

For local communities which could grow very rapidly (like Tuktoyaktuk) there may be a sense of dislocation often felt in boomtowns, especially where there is a great inflow of transients and new residents, and the former way of life changes rapidly. There is no doubt that these are difficult-to-measure impacts, but they are real, practical effects, and cannot be ignored in a cumulative assessment program. The cumulative assessment will also have to take into account the potential cost of "boom-and-bust"; that is, project closure on peoples dependent on wage economies. The current situation in many mining communities in the Yukon, and in the past at Rankin Inlet, is a poignant reminder of how important such long-term impacts may be. This is also an important point in the native argument for economic diversification of their income base.

The fourth problem is that there has been little experience

with cumulative assessment, which will require an act of political will to be undertaken. Such assessment is not a one-time effort, but requires periodic monitoring. To undertake such monitoring requires an overviewing group, with a mandate to take a regional, longer-term perspective. However laudatory the intentions of energy proponents, and however well-developed their sense of corporate citizenship, their mandate does not usually involve a regional, cumulative monitoring perspective. They may and can do some good monitoring, but should not be expected to assess the significance of that information. As an act of political will, the following questions have to be addressed: who is to do the monitoring, what is to be monitored, who reviews and interprets the information, how are the data to be used, and who pays for the program? Monitoring has often been unsuccessful because of insufficient attention to these questions, and a later chapter will make some suggestions along these lines. The problem is complicated by the relative difficulty of cumulative impact monitoring over more simple efforts. As such, the cumulative approach may be an ideal of sorts, but no less important for it.

Finally, in every assessment process there is the question of who decides which impacts are significant, and to what degree. Shall it be local people themselves, industry, some "impartial" experts, an EARP Panel, the government, or Parliament? For example, the current Dome et al. (1982) Environmental Impact Statement for Hydrocarbon Development argues that the historic experience of rapid development is that "most people benefit", and that social and economic dislocations

"would be kept to a minimum by responsible measures such as the preparation of advance plans by industry" (Vol. 5, p. 8.14). The Alaska Highway Pipeline Panel (1979b, p. 58-59), on the other hand, suggested that the impacts of "development activities on the human environment of the Mackenzie Delta" would include about 85 categories of "severely negative" impacts, including native health, culture, emotional well-being, trapping, land use, and native organizations. Clearly, the determination of the significance of impacts is not a technical exercise but a profoundly political exercise, and in fact the focal point of the whole assessment and review process. We will return to that point also.

So taking a cumulative perspective on northern development is an important but difficult task which demands that we move beyond what we are doing to date in the way of impact assessment. At a general level it can be argued that the cumulative perspective somehow points towards holistic rather than incremental or "muddling-through" decision-making, and this is why it is referred to as an "ideal of sorts". But without going into the arguments about how decisions are taken,[1] let us just say that sometimes governments have more trouble being "holistic" than local people, because governments are complex organizations with many subdivisions. What this report is arguing is simple: informed decisions are better decisions, and the better we understand (and accept) the complexity of northern

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[1] For a review, see Carley (1980).

development issues, the more likely we are to have economic and social development in the north. So while the cumulative perspective may be a general precept, this report more specifically addresses an approach to cumulative monitoring which can help us take informed decisions. The focus here is not on the decision-making process, but on one kind of an information system which can promote healthy political debate and informed decisions.

3. WHAT IS A MONITORING PROGRAM?

There is no ready, simple definition of a monitoring program. The definition of the word "monitor" itself differs according to source. The Oxford Concise Dictionary puts a monitor as "one who keeps order" while Webster's defines monitor as "to observe or watch". The difference between these definitions, that is a monitor as a policeman versus as an observer, reflects a common distinction between different types of monitoring.

A useful beginning definition of monitoring is "the systematic collection of data comprising key indicators of social, environmental, and economic impacts" (Bankes and Thompson, 1980, p. 10). Certainly the concept of monitoring is a logical outgrowth of the move to social and environmental assessment studies, and monitoring has been called continuous assessment. There is a distinction, however, between impact assessment and monitoring: the former anticipates future impacts based on experience in other similar situations and extrapolation of data, while the latter observes or reports on actual events, measured and analysed as they occur. The collection of data, or information gathering, is of no special use in itself, however, and here is where we must expand our definition of monitoring. Monitoring is the systematic collection and organization of information, which is to be used in improving the decision-making process; either indirectly by informing the public, or directly as a feedback tool designed for purposes of project management, program evaluation or policy development. Monitoring assists an organization in keeping its

policies and decisions responsive to new opportunities and unforeseen changes in the decision environment.

Monitoring therefore can be viewed as an important component of the cyclical planning, program design, implementation, evaluation and replanning process, and can serve one or more of three organizational functions:

1. Monitoring can enlighten us on the status of critical or changing issues in the policy environment which may need to be addressed by future action.
2. Monitoring can help us manage our environment by providing feedback in terms of the relative success or failure of previous action in terms of policies and programs.
3. Monitoring can be used to test compliance with regulations and contractual agreements.

So monitoring is a component of an organizational process, or more simply, a tool of organizations, be they government, industry or native or community groups. A recent report put community monitoring in an organizational framework (Procter and Redfern, 1979, p. 3.3):

> Any organization includes to some degree the functions of objective setting, plan preparation and decision-making. The organization will also have feedback from these actions to the other functions, to indicate changes in the environment of the organization, and the success and implications of the implementing actions and their outcome. Thus monitoring is an essential component of a continuing process and provides a coordinating and integrating function. It includes the collection of information, and also the analysis and evaluation of that information, and the provision of advice based on the evaluation.

A simple diagram shows the organizational context of monitoring:

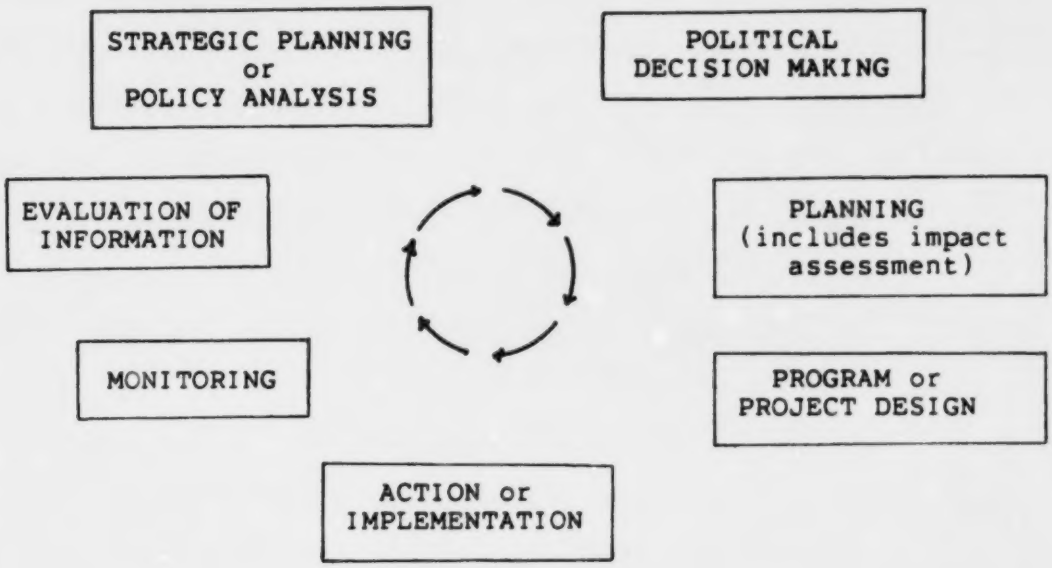

FIGURE 1.0: ORGANIZATIONAL CONTEXT OF MONITORING

The important things to note about this diagram are, i) that it is circular, that is, it represents what is a continuing process of any number of cycles which result in policy and/or action, ii) that in some cycles some steps are left out, and iii) that monitoring does not occur in a vacuum but is part and parcel of a decision making/planning process. But this general view of monitoring leaves us with some questions: are there different types of monitoring?; are there different ways of structuring a monitoring program?; and finally, who are the users of cumulative impact monitoring? The next sections look at these issues.

4. EIGHT TYPES OF MONITORING

Monitoring is a term which has been bandied about of late, but there is generally some confusion among different people about what constitutes monitoring. Perhaps Figure 2.0 can help clear up some of the confusion. Given our very simple model of monitoring as a feedback process, it can then be applied at different geographic scales, and with different organizational approaches. There are at least eight types of monitoring, which exist as kind of continuum of activity:

INSPECTION - the simplest form of monitoring is the periodic inspection of some activity for any stated prupose, for example, to ensure that safe operating procedures are being followed, and that visible environmental degradation is not occurring. For example, COGLA (Canadian Oil and Gas Lands Administration) conducts regular on-site, bi-weekly inspections of drilling activities by energy companies.

REGULATORY PERMIT MONITORING - is the continual, or periodic, recording of industry performance related to environmental terms and conditions made pursuant to the issuance of exploration, construction, operation and pollution control permits, for assessing compliance and requests for permit renewals. For example, discharges from an industrial process into a stream are usually monitored. Inspection and regulatory permit monitoring are directed to human activities, (e.g. discharges), rather than to the bio-physical environment <u>per se</u> (e.g., the stream itself.

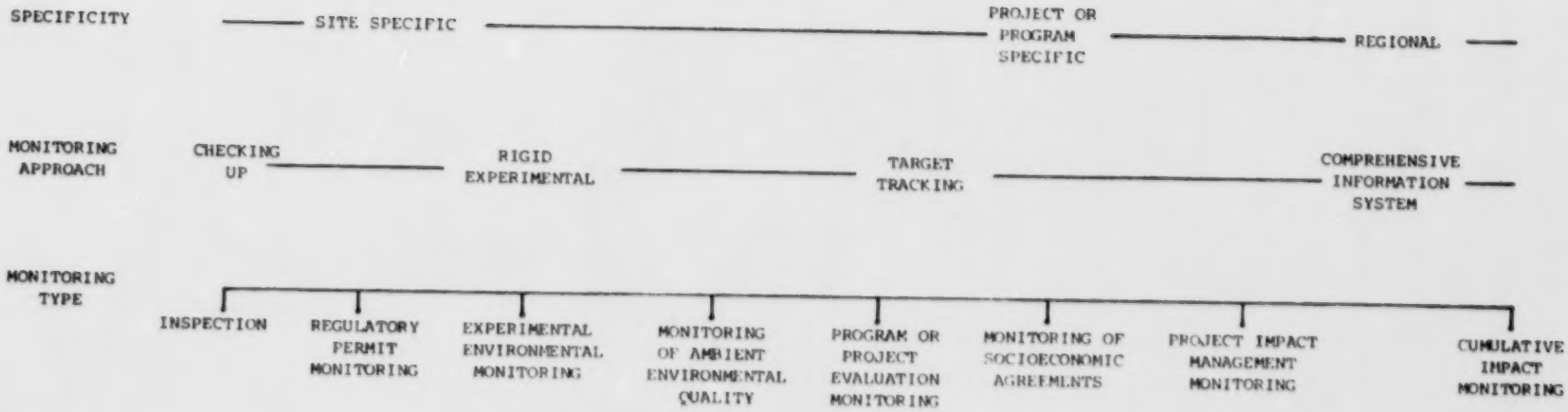

FIGURE 2.0 : MONITORING TYPES

MONITORING OF AMBIENT ENVIRONMENTAL QUALITY - is the repetitive measurement of specific ecological phenomena to document environmental change due to the direct or indirect effects of resource development or industrial activity, and to distinguish those changes from natural variability. Such monitoring is project-related, and for purposes of testing the validity and reliability of impact assessments and testing mitigative measures (Beanlands and Dunker, 1983). The focus is on the environment itself. An example is the Beaufort Environmental Monitoring Project (1983) which is examining project-related changes to "valued ecosystem components".

EXPERIMENTAL ENVIRONMENTAL MONITORING - is a scientific process designed to test specific hypotheses and predictions on how environmental change is caused and expressed. This monitoring is intended to contribute to scientific knowledge by an iterative accumulation of information, to update current concepts of ecological processes, and to provide background information on the environment which may be useful for project evaluation. There has also been social monitoring in experimental or quasi-experimental frameworks, but these have been generally unsuccessful for a variety of reasons (see Carley, 1980, pp. 162-3).

PROGRAM EVALUATION MONITORING - also called productivity measurement or performance auditing. These are attempts, generally by government departments or evaluation teams, to measure the efficiency or effectiveness of policies or programs

in terms of the ratio of organizational inputs to outputs (efficiency), or satisfaction of goals and objectives (effectiveness). Such studies are designed to (i) help determine progress towards targets or goals set by public administrators, (ii) identify problem areas and help set priorities for efforts at improved productivity and better value-for-money in government expenditure, (iii) help implement worker incentive schemes. Such monitoring efforts are usually focussed on a single set of policies or a particular service delivery program.

PROJECT EVALUATION MONITORING - similar to the above and most common in developing countries where development projects have been funded by international donor agencies such as the Canadian International Development Agency, the World Bank, and others. Also called project audits, or post-project audits, these are attempts to determine the relative success or failure of aid projects while they are ongoing or completed, not only in economic terms, but in social and environmental terms as well. The focus again is on evaluation of efficiency or effectiveness, and on value-for-money in relatively small or discrete projects. Both program and project evaluation are part of what is called "evaluation research", and there is little crossover between these activities and impact monitoring. In many cases, however, similar terminology is used, but with some different meanings.

MONITORING OF SOCIOECONOMIC AGREEMENTS OR CONTRACTS - in the context of the NWT this could also be called monitoring of "action plans". This is the monitoring of the voluntary or

contractual agreements between industry and the federal government (specifically COGLA and DIAND), and industry and the GNWT (Department of Economic Development and Tourism). Such monitoring focuses on the performance of industry in terms of industrial benefits and northern business promotion, northern employment and training benefits, social and cultural expenditure, and public consultation (e.g. Dome Petroleum Ltd., 1982). This is perhaps the most familiar and visible form of monitoring for the Beaufort Region, having been underway since 1977. In a general sense such monitoring can be oriented towards provision of specific benefits, or the mitigation of specific costs or negative conditions, or both.

MONITORING FOR PROJECT IMPACT MANAGEMENT - this is a broader form of monitoring in which a formalized organization or group regularly assesses a wide range of environmental, social, and economic impacts from a particular project. This usually occurs during project construction so as to ensure a flow of benefits, to control the severity and distribution of anticipated or especially unanticipated negative effects as they occur, and to ensure due compensation where it is required. This type of monitoring is directly linked to mitigation schemes. Organizationally, at its simplest it is carried out by project proponents and overseen by an appropriate government agency. More realistically, it is conceived of as high-level monitoring of an entire project management system by responsible agencies in association with independent groups. The intent is to report on the entire project, including objectives; criteria for

judging success; the technical and institutional means for reaching these; planning systems; adequacy of inspections and coordinations; and other tasks (Nelson and Jessen, 1981, p. 120). This is an important extension of the impact assessment process. It attempts to overcome deficiencies in that process, and especially with predictive impact statements. Such statements are static rather than dynamic in nature, and therefore unresponsive to new information and changing conditions. The energy proponents in the Beaufort Region have been asked to prepare such a monitoring program by the Beaufort Sea Environmental Assessment Panel (Dome et al., 1982, Vol. 7). Another example is the Norman Wells Database Project (1983). A side benefit of monitoring at this scale may be ex ante testing of predictions in the original social impact assessment.

CUMULATIVE IMPACT MONITORING - this is usually of interest in regions like the Beaufort where rapid development and/or socioeconomic change is taking place, but the monitoring program is not confined or limited to project-related direct or indirect impacts. Rather the focus is on monitoring all critical issues or changing patterns in a region, whether they are related to a project or occur independently of a project. Cumulative monitoring also focuses on the interrelated, and additive effects caused by a variety of industrializing projects and government interventions over time. In other words, it is the cumulative perspective made operational. Such monitoring is characterized by a regional, rather than site-specific, perspective; attention to overlapping impacts of different

projects and policies; and a time-perspective stressing the long term, incremental and dynamic nature of social change. It is usually carried out by government to provide a regional overview to citizens, and to provide a coordinated and organized flow of information for strategic planning purposes. In addition to documenting non-project-related socioeconomic changes, it also serves to coordinate the variety of information generated by less strategic types of monitoring. It can begin well before decisions on project acceptability are taken, but more likely it will be a component of a regional or strategic planning process, and therefore unrelated to the timing or acceptability of particular projects. Although the need for monitoring is well recognized, there are few examples yet of a cumulative impact monitoring program (see Chapter 7). Perhaps a joint federal/GNWT effort in the Beaufort will be a pioneering venture of this type of monitoring.

There are some interesting and varying dimensions to these different types of monitoring. The level of political contentiousness of the issues considered in the monitoring effort rises as the policy level moves from day-to-day management to the level of strategic decisions. Such strategic decisions are characterized by complex problems, a variety of alternative policies, broad decision criteria, and imprecise information. Geographically, monitoring efforts may be site-specific, program specific, project specific, or regional, i.e., multi-project. Lastly, the approach may vary. At its simplest, monitoring is no more than formalized "checking-up".

Experimental monitoring, on the other hand, demands a rigid scientific approach with careful isolation of independent from dependent variables. Many monitoring efforts involve the target-tracking approach, which establishes a target or forecast for a particular variable of interest, usually related to time. The variable may range from a pollutant level in regulatory environmental monitoring, to a proportion of northern-based employees in a work force in benefit agreement monitoring. The monitoring system then tracks the variable at set time periods to identify deviation from the target (Procter and Redfern, 1979, p. 3.16). Finally, project impact and cumulative impact monitoring demand an information system approach which identifies a wide range of critical and interrelated variables to be monitored, both quantitative and non-quantitative, within some sort of organized data framework. The next sections look briefly at the audience for cumulative impact monitoring.

5. WHO ARE THE USERS OF CUMULATIVE MONITORING?

The Council for Yukon Indians (1981) in considering Beaufort development, recently argued:

> We are concerned about the lack of effort on the part of both the developer and the government to ensure that the people affected have a clear understanding of the nature and long-term consequences of the proposed development.

This suggests a first audience for monitoring: the public at large, and community and native groups. This is especially true of cumulative impact monitoring which should be designed and published so as to enable all citizens of a region to better understand the social, economic and cultural changes occurring in their area. Such an information flow encourages participation in the pluralist, or democratic, process and may help strengthen local control as the industrial culture confronts the land bound one. The community is not a passive audience, but may take or encourage political action based on monitoring information.

The second audience for cumulative monitoring is the strategic policy maker who needs to identify particular issues requiring a policy resolution, and who uses the information from the monitoring program as an agenda for political decision-making, often between or among competing programs or objectives. This broad policy-making activity, whether at the departmental, or strategic inter-departmental, level also requires a sensitivity to the "interrelatedness" of decisions. The monitoring program helps an understanding of a broad range of issue areas which are interconnected. While sophisticated social modelling in a quantitative mode is impossible, it is part of the art of policy-making to group the interconnected cause and

effects of decision and action in various policy spheres. The operational aspect of such strategic (intergovernmental or interdepartmental) policy-making is anticipatory or forward-looking planning, which attempts to anticipate future issues and structure goals and objectives accordingly. This is the opposite of ad hoc planning, or "firefighting", which deals with issues only when they become critical problems.

The third audience for the information flowing from the cumulative monitoring program is the departmental program planner who can use that information as a background briefing on the status of change in different areas, in different departments, and at different levels of government. Cumulative monitoring, because is it broad in scope, is not a substitute for detailed and specific program evaluation, or less strategic forms of monitoring, but it does provide a valuable context, within which more specific decisions can be taken.

The fourth audience for monitoring information is project proponents or developers working in the region. Of course they also will be directly involved and interested in less strategic forms of monitoring (especially of regulatory permits and socioeconomic agreements), but as corporate citizens they will be interested in cumulative impact monitoring. This will affect them directly, as they make self-adjustments to policy and operations; and indirectly, as government or public pressure suggests changes in policy as operations are required.

6. ASSESSING THE SIGNIFICANCE OF INFORMATION IN A MONITORING PROGRAM

The last chapter made it clear that a cumulative monitoring program was an information system with a dual purpose: education and for management and response. Section II of this report describes the information system and the rationale for it in detail. before looking at that monitoring program, however, it is worth considering the essential issue in monitoring: how is the significance of the information determined, or whose values give meaning and substance to the chosen indicators. What is important is who decides whether the changes indicated in the monitoring program are good or bad, or if the good outweighs the bad.

Although there is no doubt that the determination of significance is always a political activity (that is, a value laden or subjective actvity), in the north the process faces even more difficulties than in the south. Roots (1981, p.4) suggests why:

> ...one of the important distinctions between northern and southern Canada may be that in southern Canada various elements of society often differ quite widely in their goals and objectives, but tend to have fairly common perceptions -- that is, in the south we get about the same meanings out of our information systems, even if we don't all agree with what we get --; while different groups in the north often have the same general goals to a surprising degree, but yet get quite different signals from the same information.

Perhaps nowhere in Canada is a basic conflict between value systems more apparent than in the north. That this results in a cultural tension should not surprise us. For northern natives

there is:

> ...the genuine fear of losing a shared fundamental sense of values, and thus a vital base of cultural identity, over issues which other groups see basically in terms of economy, resource management and conservation. but not of identity, that gives northern resource questions aspects of intractibility and sometimes desperation. (Roots, 1981, p.5).

The Mackenzie Delta Dene Regional Council (1983a, p.6) express the same thought in their own way, in their comments on the Beaufort Sea E.I.S.:

> There is no discussion of the Dene way of life and how the social relationships differ from the non-Dene "industrial" way of life. This is very apparent in their assumptions that 'wages are good and more wages are better'. This is not always the case. What would a cost-benefit analysis show if it was done on Dene terms compared with industry's terms?

The cumulative monitoring program should make an effort to help enlighten us as to these divergent perspectives by ensuring that a wide range of information is collected and transmitted in a readable format to the communities, and that our definitions and selection of social indicators is not pre-defined in "non-Dene" or "industrial" terms. In a later chapter an "issue-oriented" approach to monitoring is suggested which attempts to overcome some of the problems and pitfalls of what has been called "cultural imperialism".

There is a closely related issue which bedevils all attempts at policy analysis but which is also more problematic in the north, for the same cultural reasons. This has to do with the relationship between quantifiable information and non-quantifiable information, or as the economists call it "intangibles". All forms of policy analysis or impact

assessment, by their very nature of being analytic, tend to elevate quantitative information over intangible information. This results in the treatment of quantified facts as somehow more real than other values, and the elevation of monetary considerations above all others (e.g. the 'more wages are better' approach). But northern communities generally, and most especially native social systems, have an important range of wealth which is decidedly non-monetary, beginning with their relationship to the land. For example, from a submission to the Beaufort Sea EARP panel, "We, the people of Old Crow, share a feeling of sorrow for marine mammals and for...people who depend on the traditional lifestyle" (1981, p.125). What price sorrow in a cost/benefit ratio? The point is reiterated in a discussion of hunting:

> While individuals participate in hunting as individuals, it is in fact a community affair which binds people together, not only in traditional ways, but in terms of shared interests, concern for others, and with a sense of community. Value in this case then, does not refer to the nutritional value or "economic" value of game, but to its essence in terms of the beholder being human, and in this case, being Inuk. (Tester, 1981, p.193).

Even where intangibles can be explicity defined, as the native community in the region has succeeded in doing time after time in front of various panels, it is difficult for the non-native to assess their worth in terms of our accepted and often monetary categories. Roots warns that attempts at literal trade-offs reflect a "dangerous simplicity".

Geographically the problem is compounded by the fact that with rural energy projects almost anywhere in Canada, economic benefits tend to flow in the same direction as the energy, and

are widely dispersed nationally (and internationally), while social and intangible costs are concentrated locally. These intangible but real effects:

> ...fall most heavily on the people and environment in the vicinity of the projects, and the values, interests and preferences which tend to prevail when these factors are not clearly addressed, are narrowly economic and regrettably myopic. (Gibson, 1982, p.v.)

The problem is more complicated by the fact that northern energy policy reflects national Canadian energy policy, and may serve valid Canadian interests without bringing any special benefit to the north.

Thus the attribution of meaning to monitoring information is a difficult task. Two questions become central to assessing intangible information (Gibson, 1982, p.45). First, to what extent are value-laden assumptions allowed to prevail instead of an adequate information base being established? This is exactly where the monitoring program attempts to make a contribution and does so without shying away from intangibles, which can certainly be articulated and "reported" if not measured. And secondly, to what extent are values, interests, and preferences introduced and applied in an open, comprehensive and fair manner? The monitoring program can also do this in its own terms, but ensuring that it do so is a task for all people concerned with northern development, and especially those who argue for a cumulative perspective.

There are two other factors which are important, and to which the monitoring program hopefully serves as a useful tool. The first is to develop the art of policy-making in the northern context. Good information is important to this, although it is

no substitute for talent and sensitivity to the problems engendered by cultural differences and a preponderance of intangibles. Secondly, native communities are increasing acting politically to state and defend their own viewpoints and policy preferences, by regional associations (e.g. COPE, or the Delta Dene Regional Council) and special interest groups (Native Women's Association). This is important, since as we stated at the onset, evaluating the significance of monitored information is a political, and not technical, activity. Hopefully the information suggested in this monitoring program will be of as much use to native groups as to the policy analyst/planner. To help overcome problems in selecting what is to be monitored, how it should be displayed, and the extent to which it should be interpreted, Chapter Eight will outline a proposal for a pluralistic (or representative) advisory group to oversee and advise on the design and operation of the monitoring program.

7. A REVIEW OF OTHER EXPERIENCES OF MONITORING

7.1 ESTABLISHED MONITORING PROGRAMS

It is always helpful to learn from experience, but there are not many established monitoring programs we can turn to, and none upon which to model a Beaufort region cumulative monitoring program. In this chapter we examine five other experiences in monitoring: three are project impact monitoring programs, and two are closer to cumulative monitoring programs. All offer at least one lesson or example which the reader may find useful in thinking about a Beaufort monitoring program. The following chart summarizes the material presented in this chapter:

MONITORING PROGRAM	TYPE	SIMILARITIES or LESSONS
Project Huntly, New Zealand	Project Impact	Early start, long duration
Fairbanks, Alaska	Project Impact	Regular feedback and policy conclusions
Revelstoke Dam, B.C.	Project Impact	Organizational and political lessons
CIPFA, U.K.	Community-based Cumulative Monitoring	Community (not project) as a unit of analysis, performance standards
Durham, U.K. Structure Planning	Regionally-based cumulative monitoring	Similar in coverage, scale and reporting format

Project Huntly

Project Huntly, in Waikato, New Zealand, recently finished monitoring the socio-economic impact generated by the process of locating, designing, and constructing a large power station in a

small town made up of a variety of socio-economic and racial groups, including a sizeable population of native people. The monitoring project, begun in 1975 at the University of Waikato, had a main objective of gathering information which would assist planning for similar future power station projects (Fookes, 1979). The Huntly project ran for seven years of study, and covered such topics as land and housing, local authority administration, demography, traffic generation, provision of services, recreation, employment, community attitudes and stress, and impacts on, and opinions of, minority racial groups. Of special interest in a lengthy project of this type is the ability to compare resident expectations with actual events for a variety of population subgroups. In addition Huntly has established a data base of 98 variables which can be used as necessary in post-project evaluations of impact assessments in Huntly and elsewhere. Huntly is unique in that it was a longitudinal study carried on longer than any other monitoring study. It did, however, have an academic orientation and its value as a management tool is as yet unreported, although a retrospective evaluation is underway. Its main lessons for Beaufort monitoring are that the time to start is early in the process (e.g., now in the case of the Beaufort), and that we should be prepared for monitoring to continue for a very long duration. If a single power station warranted seven years of monitoring, it is likely that something the scope of Beaufort developments may require considerably longer. References to this interesting program include Fookes (1980, 1979, 1978), Marshall (1978), Stokes (1977), Vautier (1977) and Krawetz (1981).

The Fairbanks Study

Another comprehensive and lengthy monitoring program is reported in Dixon's (1978) Whatever Happened to Fairbanks?. Dixon is an anthropologist, and was employed by the Fairbanks-North Slope Borough to produce monitoring reports on a regular basis. She then used two years of monitoring activity as the basis for analysing the social impacts of the Trans-Alaska oil pipeline construction on the middle-sized Alaskan city of Fairbanks. The study itself was based on extensive collection and review of objective data complemented by interviews, attendance at public hearings and meetings and reports in the news media. The study looked at such topics as local economic impacts, housing changes, workforce migration, employment rates, marriage and divorce, mental health, minorities, native people, criminal behaviour, family disruption and other areas. The report's findings were that there were many unplanned negative effects which beset the city, often outweighing the positive benefits. Dixon's conclusion was that city governments required the feedback of monitoring, and that official government policy must require resource developers to take responsibility for the social consequences of development. She also argued strongly that local communities must be involved in the early planning phases of development.

The Revelstoke Dam Monitoring Exercise

Retrospective or comparison reports on monitoring programs tend to focus on the methodology of monitoring, for example, the

selection of different social and economic indicators, perhaps because this kind of information is more readily transferable among diverse jurisdictions. More important, and difficult, however are the political and organizational arrangements upon which a monitoring program can sink or swim. Such organizational arrangements tend to be case-specific, and difficult to transfer because of political, cultural and geographic differences. Therefore, it is useful for us to draw on a Canadian example and learn from the organizational difficulties encountered in an attempt at monitoring in British Columbia.

The Revelstoke monitoring program is fairly well documented (Kopas, 1980; Vincent, 1980; Bankes and Thompson, 1980). The program was established following public hearings on the Revelstoke Dam project in 1976. These public hearings were convened under the Comptroller of Water Rights who, at the time, was the main government ajudicator on the acceptability of the project due to his control over the issuance of various permits required by the proponent. Monitoring was to take place partly as a result of a directive by the Comptroller of Water Rights and partly as a result of promises made by the proponent, B.C. Hydro. These promises were made at the hearings, and based on recommendations of their consultants. From the start the program's organizational framework reflects this dual mandate, and in the end a lack of organizational integration and clarity was to be the program's undoing.

Figure 3.0 shows the organizational framework for the Revelstoke monitoring program. A full discussion of this framework is found in Bankes and Thompson (1980, pp.23-34). The

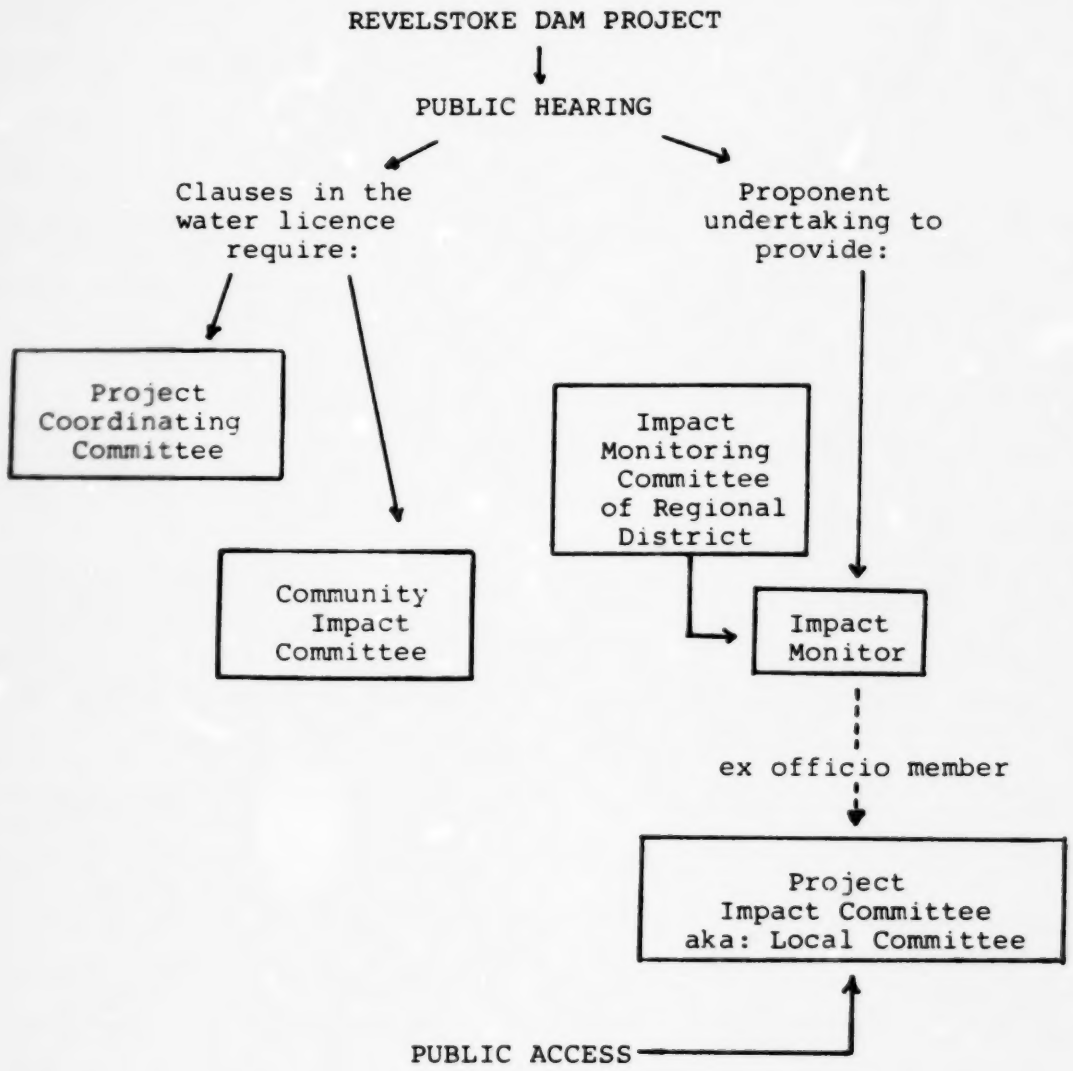

FIGURE 3.0: ORGANIZATIONAL FRAMEWORK FOR MONITORING AT REVELSTOKE

committees on the left are those required under the terms of the water licence, and those on the right as a result of the proponent's promises delivered in the course of the public hearings. The Project Coordinating Committee was a group made up of representatives of major affected provincial ministries, and resource and social service agencies. B.C. Hyrdo paid the expenses of this committee, which was responsible for monitoring a range of impacts including reservoir clearance, construction camp location, recreational facilities, fisheries enhancement, environmental guidelines for construction and local impact mitigation. The committee reported directly to the Water Comptroller.

The Community Impact Committee (CIC) was also based on a clause in the water licence, and monitored consultation between the proponent and appropriate local agencies. The CIC was also made up of representatives of social service agencies, and did most of its business in Victoria. The RPCC and CIC were, for all intents and purposes, not accessible by the general public.

On the right side of Figure 3.0 we find a parallel monitoring structure set up by the proponent in the Revelstoke area. This began with a three-person subcommittee of the Regional Planning District Board known as the Impact Monitoring Committee (IMC).

The IMC in turn employed a full-time person called an impact monitor, but with the salary funded by the proponent. The impact monitor was to 1) measure project effects as a test of the impact assessment, 2) provide impact information to local communities, 3) provide information to the CIC as a basis for

mitigation of negative effects, and 4) to build a data base designed to foster understanding of the impacts of large programs. Finally, there was still one more committee - the Project Impact Committee, also known as "the local committee". This was appointed by a steering committee of one representative of the proponent and two representatives of the Regional District and consisted of seven local citizens, plus a non-voting contingent of the impact monitor, and representatives from the proponent, B.C. Hydro, the Regional District and the City of Revelstoke. The local committee received submissions from individuals and organizations on socio-economc and environmental impacts and recommended ameliorative action. However, the local committee had no authority, and no funds. For these reasons, the committee was largely ineffective, and was perceived as such by the community.

As for the impact monitor, that position was very contentious. The first impact monitor resigned in disagreement over his role with the proponent, who cast him in a neutral, observing role, while he felt that surveillance and policing powers were a necessary component of the job. The second monitor accepted the observer role, but ended resigning over political differences of opinion. In any event, it appears the impact monitor's role was weak and ill-defined. He had no access to decision-making bodies or agencies with statutory authority, and only indirect access to the public. He also had no power to link impacts with mitigative or compensatory measures, which is a prime task of project impact management.

The Revelstoke monitoring program, therefore, was not very successful. With hindsight, we see that the program ran into organizational difficulties stemming in part from the dual nature of the program, with half the program answerable to the water comptroller, and half rather ad hoc. In short, one lesson is that the whole arrangement was far too complex, and therefore probably unworkable from the start. This difficulty may be eased by simpler unified institutional arrangements for monitoring.

Part of the problem, also, was related to the lack of a conceptual framework for organizing the monitoring program, that is, deciding what information to collect. Hopefully, this report provides such a conceptual framework, and rationale for selecting particular socioeconomic indicators based on community and regional issues, and that problem can then be avoided.

There is another critical lesson here. People living in a project development area will expect monitoring to be linked somehow with mitigation. That is, if negative consequences of development are identified, they will want these put right by some suitable government authority. The cumulative impact monitoring program however is a broad, strategic policy and planning information system. Within this broad framework more detailed but equally important monitoring efforts (benefit agreement monitoring, project impact monitoring) must also be arranged, and directly deal with the problems of mitigation and compensation. The cumulative monitoring framework provides a useful context, but is no substitute for these more detailed arrangements for project impact management and mitigation among proponent, government and community.

Chartered Institute of Public Finance and Accountancy System

In the next two examples we move away from project-specific monitoring efforts and examine two cumulative monitoring programs, which are closer in form and intent to what a Beaufort region cumulative cumulative monitoring program might look like. The first is the monitoring approach of the Community Indicators program of the U.K's. Chartered Institute of Public Finance and Accountancy (CIPFA, 1979). Here the emphasis is on community as a unit of analysis, rather than project-related impacts. The CIPFA program publishes social indicator data for U.K. communities and attempts to aid decision-making by local government. The system relies, as much as possible, on existing data sources. The criteria for structuring the monitoring program was that all indicators be readily comprehensible, disaggregated to the local community level, and as up-to-date as possible. The indicators are further classified into indicators of normative need, that is target standards laid down by various authorities, and indicators of perceived need, which is felt by individuals or expressed institutionally, for example, in the form of a waiting list for public housing.

An interesting aspect of the CIPFA system not generally found in other monitoring programs is the identification of "principal client groups" for the range of services which a local government might offer. This makes the indicators themselves more readily policy relevant. Client groups are of three types: those directly identifiable (e.g. school pupils) who impose a mandatory obligation for service, those indirectly identifiable (e.g. the elderly) whose needs may or may not be

met by government programs, and the population generally, for such services as public transport. For example, a service need for the population group 'under 5' is nursery education and indicators of service provision include 'places per 1,000 population' and 'pupils per nursery assistant'. For the client group 'total population', one service is libraries and an indicator of service population is bookstock per 1,000 population. The CIPFA system also identifies or classifies the most similar local authorities to facilitate comparison of 'like' communities.

CIPFA suggests that its community indicator system is useful for three reasons. First it is designed to facilitate the setting of priorities for resource allocation among various services in a community, both for policy and budget planning. Secondly, it assists in performance measurement - the study of efficiency or the ratio of inputs to outputs, and the study of effectiveness, which is the extent to which goals or objectives are met by service provision. Thirdly, the information produced by the CIPFA system provides ammunition for local governments in their negotiations with central government for various grants.

In each case, it is suggested that the CIPFA indicators can be used to examine 1) the comparative provision of a service between authorities, 2) trends in provision in relations to an indicator, and 3) geographical variations in service provision within an authority. CIPFA is interesting to us for its focus on community and its efforts to be relevant to community-level decisions, for disaggregating data for various client groups, and for its attention to service levels and standards. However,

it is worth remembering that appropriate standards for northern communities may not always be available. On the other hand, any quantitative social indicator always implies some standard of comparison when it is normative, that is, when we decide it is high or low, or good or bad, or sufficient or insufficient. The CIPFA program therefore reminds us that a step in interpreting monitoring information is the formulation of explicit or implicit standards.

Monitoring Structure Plans in the U.K.

Probably the closest in topic (or issue) coverage and reporting format to what is being proposed in this report in terms of a cumulative monitoring program are the annual reports prepared at the County Council level of government in the U.K. These report on the progress or lack of it, during the past year, towards planning objectives clearly laid out in each county's "Structure Plan". In this case monitoring is seen as one sub-system in a broader planning system which attempts to coordinate subregional decisions in accord with local and regional objectives.

The annual reports of the structure plans are of considerable interest to us because the actual contents of these monitoring reports, in terms of a comprehensive, non-project related range of topics, are very much like what will be proposed for a cumulative monitoring program. Fortunately the fact that the structure plan reports provide a good example of a cumulative (or comprehensive) monitoring reporting format has not been lost on Ontario's Ministry of Municipal Affairs and

Housing, and they have recently reproduced an entire 45 page County Council annual report, in this case, for County Durham (U.K.) 1981. This is to be found in the Ontario Government's Monitoring Guidelines: An Approach to Monitoring Official Plans (1982), which sets out a framework by which Ontario municipalities can monitor their success in implementing official plans.

The 1981 annual report of Durham County Council (U.K.), which Ontario hopes its municipalities will emulate, begins by discussing the progress in meeting 19 aims set out in their structure plan. For example, success is reported in creating job opportunities in one part of the county, a new highway is constructed, several "shopping schemes" are opened, and new recreational facilities are provided. On the other hand, an aim to reduce unemployment overall in the county is unsuccessful, and they are concerned that this will lead to population decline. Then the report moves on to discuss this information in light of the national and regional context, which has a strong bearing on unemployment. An outline of the rest of the Durham County monitoring report looks like this:

Population and Employment Structure (actual and projected)
Industrial Expansion and Contraction
Housing and Settlement Pattern
Transportation
Education, Social Services and Health
Shopping and Commerce
Sport, Recreation and Tourism
Mineral Extraction

Appearance of the County

Nature Conservation

Financial Resources

Summary of Major Findings

It is recommended that anybody interested in examining a good cumulative impact monitoring report have a look at the Durham County Council document.[1] It is compact (45 pages), readily understood, comprehensive on topic coverage, hierarchical (moves from the general to the specific), and incorporates quantitative information in straightforward discussion.

7.2 LESSONS FOR MONITORING

What are the lessons, then, which point towards a good institutional structure for monitoring? The following elements are involved:

1. Monitoring is an important element of the post-approval stage of project appraisal, but a proposed monitoring program is not an element in the determination of project acceptability on economic, social and environmental grounds. Monitoring may be a condition of project approval, which is based on more important factors. There may be a tendency to confuse grounds for project approval,

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[1] The Ontario report in which it is reproduced is available from: Ontario Government Bookstore, 880 Bay Street, Toronto, Ontario. M7A 1N8 Cost: $3.00.

with limiting conditions or constraints on the approval. Too often these days, the provision of monitoring is seen as somehow helping to justify projects. It can do no such thing and project acceptability must be based on substantive, not on procedural grounds.

2. The objectives of the monitoring program cannot be assumed but must be clearly thought out. This is the first step in the development of such a program. The objectives will differ for different types of monitoring. For example, a cumulative monitoring program will have a major objective of providing broad regional and community level information on socioeconomic changes and trends on an annual basis, reported to the public, government and industry. Project impact monitoring will have an important objective of identifying project-induced impacts and linking these to a mitigation scheme.

3. The roles of various individuals and committees in any monitoring program should be well-defined, and designed specifically to fulfill the stated objectives. The whole proposal should be as simple as practicable.

4. The individuals and committees involved in monitoring must have sufficient authority to carry out the stated objectives. Such authority may have to be delegated from a variety of sources: territorial, federal, municipal, and proponent, and in this sense monitoring will require an

act of political will and commitment on the part of the agencies involved. The monitoring group, on the other hand, should answer directly to one responsible coordinating committee which is the channel by which the entire monitoring program relates to a variety of agencies at different levels of government, and to industry. Monitoring requires a good measure of inter-agency cooperation.

5. It should be made clear at the onset of monitoring how diverse, and sometimes competing, governmental jurisdictions will interrelated during monitoring, and by what authority or agreement.

6. The individuals and committees involved in the monitoring program must have sufficient financial and manpower resources to carry out the stated objectives. This may sound obvious but an inability to do good work because of scarce resources means a weaker program.

7. The monitoring program should be designed in such a way as to be an open process. The public must have confidence in the monitoring program, and this will certainly not occur if it works <u>in camera</u>. The public should be able to readily ascertain who is responsible for what in the monitoring program, and how and where the public has access to that program, preferably through a community-based advisory committee. This suggests that a maximum of

two committees (coordinating and advisory) can oversee the monitoring effort.

8. Monitoring should begin early in the planning process and continue through to the operational phase of the project. The committees to which the monitoring program reports must therefore have jurisdiction over time.

9. Finally, methodological issues in monitoring design may be subservient to organizational issues, but they are not unimportant. A proper data base for monitoring socio-economic and environmental indicators is required, as is a "measurement rationale" for the selection of indicators.

8. AN ORGANIZATIONAL FRAMEWORK FOR CUMULATIVE MONITORING IN THE NORTHWEST TERRITORIES

Just as this report reflects the foresight of an equal cooperation of the two senior levels of government for the Beaufort region, so a successful monitoring program will require the same degree of cooperation. Given that the type of monitoring being proposed here requires a strategic, intergovernmental, and interdepartmental perspective, it is apparent that a new cooperative body is required, working at the appropriate policy level. Certainly both DIAND and the Energy, Mines and Resources Secretariat of the GNWT have the interest and the political mandate to undertake monitoring at this policy level. It has also been made clear that this type of monitoring is not a substitute for more detailed socioeconomic agreement monitoring, project monitoring, or for program evaluation efforts at the departmental level.

In addition to clearly having the appropriate political mandate, an equally convincing argument for cooperation comes from the practical arrangements required for gaining access to the relevant information bases. Good monitoring for the region is not possible without ready access to federal and territorial departmental data bases, both of which are essential to the monitoring effort. Although there is a wealth of information to be collected in the region, and in Yellowknife, most of it is not public or published information. The friendly cooperation and commitment of both federal and territorial departments, in the region, and the NWT headquarters level, is essential to good monitoring.

There are of course regular jurisdictional disputes between these levels of government, and the procedural aspects of these disputes cloud many attempts at coordinated activity and often obscure substantive issues. However cumulative monitoring should be perceived as an important, relatively benign, and mutually beneficial issue which will not upset the apple cart. There are other forums for disputing the constitutional issues of the day.

Probably the best argument for cooperation in a monitoring venture is that it would be in the public interest of the people of the region, faced as they are with the prospect of a tremendous level of resource development activity, and the equally unsettling possibility of a downturn in Beaufort exploration. The problems and prospects of the people of the region don't generally divide along either governmental or departmental lines and any realistic description of the complexity of their lives requires cooperation in the public interest. The very arguments for the cumulative perspective advanced in Chapter 2 also make a good case for cooperation, which in turn is the prerequisite for any hope for coordination in addressing the dramatic prospects and pressing problems of the Beaufort region.

A simple but new organization is recommended to undertake the monitoring: a federal-territorial monitoring secretariat, based in Yellowknife, and overseen by two committees, one sitting in the region, the other in Yellowknife (Figure 4.0). Although there is considerable pressure to place such a secretariat 1) within an existing agency or 2) within an existing committee proposed by one or the other level of

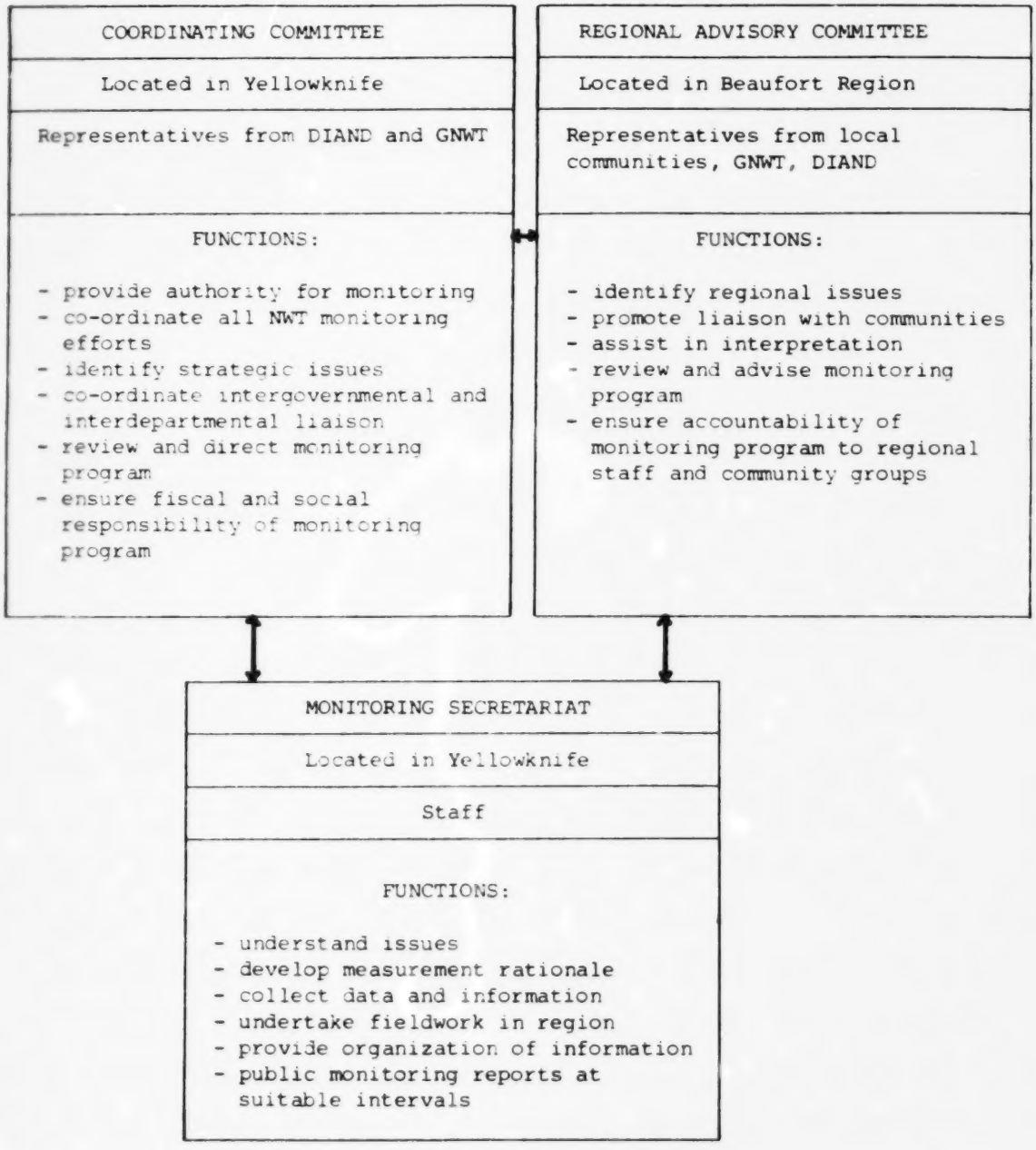
COORDINATING COMMITTEE
Located in Yellowknife
Representatives from DIAND and GNWT
FUNCTIONS:
- provide authority for monitoring
- co-ordinate all NWT monitoring efforts
- identify strategic issues
- co-ordinate intergovernmental and interdepartmental liaison
- review and direct monitoring program
- ensure fiscal and social responsibility of monitoring program
REGIONAL ADVISORY COMMITTEE
Located in Beaufort Region
Representatives from local communities, GNWT, DIAND
FUNCTIONS:
- identify regional issues
- promote liaison with communities
- assist in interpretation
- review and advise monitoring program
- ensure accountability of monitoring program to regional staff and community groups
MONITORING SECRETARIAT
Located in Yellowknife
Staff
FUNCTIONS:
- understand issues
- develop measurement rationale
- collect data and information
- undertake fieldwork in region
- provide organization of information
- public monitoring reports at suitable intervals

FIGURE 4.0 : A SIMPLE ORGANIZATIONAL FRAMEWORK FOR MONITORING

government, this is not recommended. First, existing agencies with more specific monitoring tasks are generally not equipped financially to expand their services to include cumulative monitoring. And in every case, their existing monitoring mandates are not directed towards monitoring at this strategic level, nor generally is their departmental or agency perspective appropriate to the task. In addition, existing regulatory agencies and mandated authorities may be reluctant to take on further responsibilities. Second, existing committees, while more appropriate in focus, generally have no staff and are not equiped to oversee staff, and in any event have sufficient tasks to occupy themselves. Certainly both the Northern Benefits Committee and the Development Impact Zone Groups are undertaking very useful work, and their tasks are difficult enough without having to actually embark on cumulative monitoring. The information generated by a monitoring secretariat can certainly aid them in their respective tasks, and they in turn can advise the monitoring program.

If it is found in the future that an existing intergovernmental committee is accepted by both levels of government as an appropriate vehicle for this monitoring, then the responsibility can be put there. At present there is no existing organizational arrangement which meets this criterion, and so it is recommended, in the public interest, that a new secretariat be arranged.

What is proposed is a small secretariat based in Yellowknife and consisting of one or two researcher analysts with secretarial assistance. A small team such as this would be

sufficient to carry out the monitoring activities suggested in Part II of this report. Their activities should be overseen by a coordinating committee consisting of an appropriate representative of DIAND and the GNWT. The tasks of these two committee members would be not only to direct the monitoring program, but equally important to encourage cooperation between the program and the departments and agencies of their respective governments. To do so would require not only good communicative skills but a sufficient flow of political commitment from ministerial levels to allow the monitoring to proceed successfully.

A second committee, a regional advisory committee, could sit periodically to discuss and advise the monitoring program in light of local knowledge. Such a committee should consist of representatives of government from the region plus representation from appropriate native and local groups. A special task of both the coordinating committee and the regional advisory committee would be to meet annually to review forthcoming production and format of an Annual Social Report on the Beaufort Region - the most important publication of the secretariat.

One possibility for a regional advisory committee which might be considered is the Beaufort Mackenzie Delta Development Impact Zone Group, known as the DIZ group. Both DIAND and the GNWT appear to agree that the DIZ group has "considerable acceptance by constituent communities," and is "a focus for regional issues" (Indian and Northern Affairs, 1983). Given that the DIZ group will be functioning as the Regional Advisory

Committee to the Northern Benefits Committee on matters relating to Canada benefit packages and action plans, it would seem useful for the DIZ group to at least be considered as a possible Regional Advisory Committee within the structure outlined here.

A reasonable concern which might be raised at this point is why the monitoring secretariat itself would not be based in the region. Certainly some good arguments for so doing present themselves and one of the best is that persons working in the region would experience first hand some of the impacts of development activities, and would have ready access to front line staff of departments and agencies providing much of the statistical basis for the monitoring program. This would give them, no doubt, a better understanding of issues and statistics than might be had at a distance. This is an important point. However, on balance, a number of factors suggest a more centralized location. First, the flow of information is almost entirely from the region to Yellowknife, and the access point for the information is almost always in Yellowknife as opposed to the region. The fact is that Yellowknife is the most efficient place to collect the type of information proposed here. Whether this is a good political arrangement is not an issue addressed here. Certainly one critical responsibility of a monitoring program is to give useful and organized information back to the people in the field who first collect that information. These data are presently compiled in Yellowknife. Of course the members of the secretariat cannot do good monitoring without spending a considerable amount of time in the region, taking advice from local people who understand the

situation. Full cooperation from regional officials, staff, and community organizations would be essential for good monitoring. In short, the headquarters level and the regional level must work closely together.

Second, and perhaps more important, the monitoring proposed here is really at a strategic, policy oriented, level, rather than at a regional level. In other words it must be concerned with the interaction between the region and the wider world, and addressed therefore at a headquarters level. Organizationally what is being proposed is the Beaufort region as a prototype for a NWT-wide monitoring program, which one day might well be extended to other development regions in the NWT: Fort Smith or Lancaster Sound, for example. Once a regular flow of information into the secretariat begins, there will be economies of scale in extending efforts to other regions. This demands an efficient, cost-effective, centralized arrangement in Yellowknife, for undertaking the type of cumulative monitoring proposed in this report. (Project impact monitoring, on the other hand, would best be conducted from an office in the region, say at Inuvik.)

The general public would certainly be welcome to interact with the monitoring secretariat through the regional advisory committee. It is likely though that they will mainly know of the monitoring program through the Annual Social Report on the Beaufort Region which will hopefully be a well received public document. Certainly very good press coverage could be anticipated. The next section looks at the annual report in more detail.

An issue which needs to be anticipated is the potential

role of the Yukon Territorial Government and the Council of Yukon Indians in such a monitoring program, especially given recent interest in possible development at Stokes Point and King Point. It is the opinion of the researcher that information on the Yukon (and mainly on Old Crow) should be incorporated into the annual report. This could be done with a minimum of difficulty, and definitely should be done if and when appropriate. However, it is also the opinion of the researcher that jurisdictionally the present situation is as complex as it needs be. Therefore informal arrangements with Yukon agencies are preferable until such time as more formal arrangements are required, and until a monitoring program is well and successfully underway.

Finally, there is the question of who will pay for the monitoring effort. The basic staff expenses are likely to be for one or two researcher/analysts, depending on skill level, and secretarial assistance as required. Administrative expenses will include periodic travel to the region, and publication of the annual report. Certainly the first inclination is for equal funding from the two levels of government. However, given the current flow of resource revenues to the federal government and the subsequent funding of the GNWT by the federal government, there is an equally valid argument for the base funding to come from DIAND, without prejudicing the prerequisite for joint and equal administration of the program. Another possibility would be for industries active in the Beaufort region to contribute to a revolving monitoring fund, which could in turn be used to defray expenses as necessary. Such a fund could be administered

by the coordinating committee, with industry participation.

9. THE BEAUFORT MONITORING PROGRAM: A FOCUS ON ISSUES

The main methodological problem in developing an indicator system is in deciding what needs to be measured: what to include and what to leave out of the monitoring report. Things omitted mean criticisms of ignoring or hiding information. If too much is included reports become unwieldy, unread, and contribute to information overload.

Past experiences at monitoring are not much help. In some cases the list of indicators reflects more or less what data are available and not much else. Such an approach may tend to ignore what is important in favour of what data exist. In other cases, the list of indicators represents no more than the opinion of the researchers on what is important. In still others a very comprehensive list is drawn up but with no attention to whether any data can be collected without prohibitively expensive survey research. Some monitoring efforts are based on good lists of indicators, usually where the objective of the program is to measure progress towards specified planning objectives. However, this doesn't help in the case of the Beaufort region as the task is different, and planning objectives are not readily formulated.

Elsewhere the author (Carley, 1981, p. 157) has argued that no socio-economic indicator should be included in a social report unless it has been justified by a written "measurement rationale". This is a written statement which explains why a statistic should be regarded as a measure of a social variable under consideration, and why that variable is considered important. By making the argument explicit, the researcher

invites people to examine his logic and accept or reject it. Rejection will suggest the monitoring program needs to be overhauled. Sufficient acceptance (not everyone will agree, no matter what) suggests that there is support for the monitoring program as a window on reality. A measurement rationale also reduces the dangers of "cultural imperialism" in which the researcher's own values substitute for the values of those living in the region.

What follows is an extensive measurement rationale based on what is hoped is the answer to the following question: what are the important social, cultural and economic concerns facing the people of the Beaufort Region? The selection of indicators is then derived from a thorough examination of these issues. In every case the presentation of an indicator is justified by linking that indicator with critical issues. Issues are paramount, indicators help us think about issues. The issues themselves are often politically contentious, but the report tries not to take sides. It merely says: "there is strong evidence that this is an issue which should be monitored" to contribute to discussion on the social development of the Beaufort Region. The process is outlined in Figure 5.0.

How were the issues determined? First of all, by extensive interviews with people knowledgeable and concerned about the region, over 70 interviews in all. Second, all local and native newspapers, newsletters, and NWT newspapers were examined, covering the last four years. Third, very close attention was paid to written statements of local and native groups, and government agencies. Many of these statements were issued in

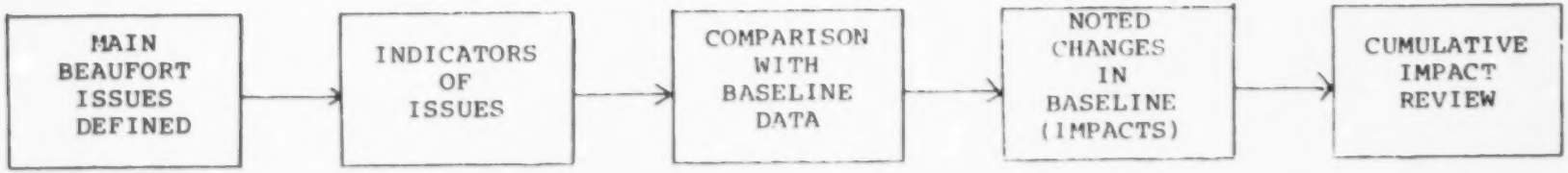

FIGURE 5.0 : SIMPLIFIED STEPS IN THE ISSUE TO REVIEW PROCESS

response to a call from the EARP panel for comments on the Guidelines for the Beaufort E.I.S. (1981) and on the E.I.S. (1983) itself. More than 2,000 pages of written submissions from these and other sources were reviewed in detail. This review proved most valuable especially in ascertaining the formal views of native groups. These statements, carefully prepared by band and hamlet councils, hunter-trapper associations, and regional and national native groups, are clear and straightforward, and their views and opinions are recorded for anyone who takes the time to examine them.[1]

Finally, there was an extensive review of reports and articles dealing with the region, going back to the late 1950s. These included scientific reports, historical studies, current affairs annuals, one-off consultants reports, and annual government publications. Especially useful sources of such information included: the Town of Inuvik, DIAND's Scientific Research Centre in Inuvik, DIAND's Yellowknife library, the GNWT's Yellowknife library, and the library of the Boreal Institute for Northern Studies in Edmonton. All references are listed at the conclusion of this report.

Was the process a useful one? The answer lies in the 17

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[1] A strong argument can be made for paying close attention to what native groups say publicly. Their statements are often arrived at after lengthy deliberation, and reflect consensus positions. There is the added advantage that so doing avoids the main social science problems in non-natives addressing native issues: finding a suitable 'key informant' is difficult, there is unwillingness to commit to strong opinions by a single representative in the absence of consensus deliberation, and of course there is the cultural bias and gross cultural differences which are common in survey research.

sections of Part II of this report. Each section addresses a major issue area. There is an examination of the issue, followed by a list of suitable indicators. Of course, there are issues for which there are no suitable indicators. This fact is stated, and not all indicators are quantitative. Sometimes a brief report is called for (e.g. on land claims, or on the expansion of native language programs). For the indicators, sources for the material are given. Where possible, a particular contact person is identified who could be instrumental in securing the necessary data, and who could answer questions about the usefulness of the information. Finally there is a further section entitled "discussion" which addresses, not the substantive issue itself, but rather any statistical aspects of the application of the indicators.

10. RECOMMENDATION: AN ANNUAL SOCIAL REPORT FOR THE BEAUFORT REGION

The following seventeen sections of Part II represent not only a measurement rationale for a monitoring program. They are also designed to specifically suggest a format for a report on the results of the monitoring: the annual social report, or more accurately the annual social, cultural and economic report. The report should consist of a brief discussion of the critical issues (the list could be expanded or contracted). The indicators are then presented, followed by a discussion of prospects and pitfalls to be expected in interpreting the information. No attempt need be made to formally determine the significance of the information, that task is left to the reader. But where different sides to an issue exist that should be explained as clearly as possible. The beginning of the report should contain a summary of the important points, put as briefly as possible. The example from Durham County Council (in Ontario Ministry of Municipal Affairs and Housing, 1982) gives a further idea of what such a report should look like.

In the preparation of the report the monitoring secretariat should expect to have the guidance of both the coordinating committee and the regional advisory committee as to content and special issues to be addressed. Special attention should be paid not only to content but to presentation, which should be as clear and straightforward as possible.

The monitoring report needs to be useful to government, industry and the community-at-large. It should be widely distributed, and designed so as to facilitate discussion among

interested parties. It may be that a longer document, and a newspaper summary would be appropriate. The document, or report, would present information on detail but not in an overly statistical manner. One clear lesson from other social indicator efforts is that there should be a good, jargon-free, text which explains all the major points and the statistics, and highlights particularly important or dramatic information. Statistical charts or graphs are only to serve as a back-up information. Also, it may be that a newspaper-style flyer should be prepared to summarize the important or dramatic points. This could be widely distributed throughout the region, and translated if necessary. It need not be overly long in length. The monitoring secretariat should look to the Regional Advisory Committee for guidance on the best ways to reach the community level.

The social and economic indicators in the social report will only have meaning when they are compared with some base against which changes may be measured, that is with past data and experience. This is what is commonly called a baseline, and comparison of data from a number of years is a trend-comparison. In social monitoring it is difficult to develop a tidy and systematic baseline. Some aspects of social life have been well documented, others have been ignored. Some aspects are studied once, or occasionally and irregularly, others studied regularly or even annually. So while there is a substantial amount of baseline information, it is very generally irregular in content and time duration of statistics.

It is recommended that the first annual social report include a review, for each issue area, of the available baseline

information. This should be followed by a selection of the most appropriate baseline indicators, and some tabular linking of trends over time. This would accord with the recommendation to the Science Advisory Board of the NWT for an "Historical Handbook on Recent Demography" based not only on census data, but on all available sources (Hamelin, 1979). It is accepted that this report would be longer than later monitoring reports, and that it would hardly be systematic in terms of the quality and time-series availability of comparative data. Nevertheless, there is a considerable amount of existing information from a wide variety of sources to call upon in this first annual report. In the references at the conclusion of this report those documents particularly relevant to a monitoring effort are specially marked.

Reports subsequent to the first one can be considerably shortened. They will focus on new issues and progress or changes on existing issues. Decisions and actions which occurred in the previous year, or the lack thereof, will be the focus.

Finally there is the question of the timing of the issuance of the report. There seems to be little point to try to issue it more than annually, as much of the information really only has meaning interpreted on a yearly basis. Further, there seems to be no substantive argument for doing so. This doesn't mean that the monitoring secretariat might not engage in special studies during the year, on particular issues, as directed by the coordinating or regional advisory committees. Only that the social report is best as an annual document, issued in the same month each year. It appears that a June or July publication date

may be best, because much of the information seems to come available at the end of either calendar, or fiscal years, or a little later in the case of the school year. Further, in terms of topicality this puts the review of the previous year's activity more or less at the beginning of the summer's drilling season, which may be appropriate.

Part II now presents the issues and indicators for the Beaufort region in a monitoring framework.

PART II: ISSUES AND INDICATORS FOR A BEAUFORT REGION MONITORING PROGRAM

1. DEMOGRAPHY

1.1 THE ISSUES

There is a reasonable concern in the region over the potential effects of development-induced population change. Both rapid growth and rapid decline are possible because of the very narrow economic base, and depending on the state of oil and gas developments. For example, scenarios prepared for environmental impact studies range up to 21,000 people in Inuvik and 2,000 in Tuktoyaktuk by the year 2000. They also envision a possible 16,000 industry workers in the year 2000, with 20% being "northerners". Although these estimates may be exaggerated, many socio-economic changes can be derivative of even much smaller population changes, ranging from changes in political control to increased demands on community infrastructure. Population changes in each community should be monitored annually.

1981 Census data provide reference points for subsequent analysis, given its limitations (see below). Census variables available for the regions' communities (called census subdivisions, or CSDs) include: sex and age groupings, marital status, mother tongue, and ethnic origin. In the latter category, for 1981, the Metis group is distinguished from non-natives for the first time.

The GNWT Bureau of Statistics is the main source of information on current community population and population forecasts. They issue semi-annual population estimates which contain information on age, sex and ethnic origin and are based on models which take into account births, deaths and migration. From these estimates a current population pyramid for each

community can be prepared annually. In addition, population estimates can help people think about the future. These estimates take into account possible patterns of migration, and natural increase, which is the excess of birth over deaths compared to the total population. Changes in the rate of natural increase over a longer period may reflect both cultural changes, such as attitudes to birth control and abortion, and proportion of persons of child-bearing age in the population. High rates of growth based on natural increase and/or in-migrations may have considerable impact in terms of provision of public services.

Native people are concerned about alterations in the native/non-native ratio in the region. They are worried that development might make them a minority in their own land (the current regional ratio is about 64/36). In the case of rapid resource development there is worry about incoming non-native residents, and about non-native transient job seekers. In the case of non-native residents, the worry is about their effect on what are essentially native communities. For example the affairs of Tuktoyaktuk are controlled by the Inuit residents themselves, and they would not like to see this situation change. The same is true of other communities in the region. The native/non-native ratio can be monitored using data from GNWT Bureau of Statistics.

The effects of development-induced growth could of course vary depending on the strategy for housing in-migrant workers. These strategies yary from enclave work camps to permanent residency in existing communities. In the middle is a situation such as at Tuk, where non-local workers are confined to the

camp, but where the camp makes use of community infrastructure such as water supply, solid waste disposal areas, and the airport.

Another facet of this issue has to do with the length of residence of the non-native population, many of whom don't stay in the region for more than 3 or 4 years. Estimates elsewhere in the NWT suggest that about 80% of non-transient, non-native residents are prepared for no more than a few years stay in the Arctic (Jensen, 1979). Some leave after building up a "nest egg" of cash; others, especially government employees, are transferred or promoted out of communities. For example the 1981 Census identified about 80% of the Inuvik population as "movers" - that is they weren't living in the same place as they were five years previously. Similarly, the figure for movers in the whole of the NWT's non-native population approaches 60% (Joyce, n.d.). Of course, there are important exceptions in each community.

There are two sides to this issue. First, the natives risk becoming a minority to what is essentially a rotating non-native population. Second, there is a considerable turnover of government staff, which presents problems for permanent residents who often have to interact with a constant stream of new people. The turnover problem is explored separately in each section of this report where it is an issue. The larger question is of course "what is a northerner?", and this has important implications for political development, voting and employment. There are many definitions ranging from a two year residency requirement for a resident hunting licence to the Dene's

proposed ten year requirement for voting rights in Denedah. In any event, some measure of the mobility of the population in the region, and in each community, can be monitored in five year increments using data from the census.

Unfortunately this five year period may be inappropriate for a rapidly growing and developing region. Perhaps in future alternatives to the census as sources for mobility data may be developed. Such sources might include: family allowance program data, registrations to the NWT Health Care Plan, and school enrolment information.

1.2 THE INDICATORS

Current population (by age, sex and ethnic status for each community)

Forecast populations (by ethnic status for each community)

Growth rates (for each community)

Current native/non-native ratio (for each community)

Population mobility (for the region)

1.3 THE SOURCE

Bureau of Statistics
GNWT
Yellowknife
X1A 2L9
Contact person: Nunda Rao
Telephone: 873-7653

1.4 DISCUSSION

The 1981 Census for the NWT was based on a 100% sample and is therefore relatively reliable, given the small populations.

However, there is less likelihood of random errors cancelling out with small populations, and therefore census data, even when collected on a 100% basis, should be used with some caution.

Also, all census data is subject to a confidentiality procedure known as "random rounding", which prevents the possibility of associating small numbers with particular individuals. Under this method all figures are randomly rounded up or down to a multiple of five. For example, the number of "status Indians" in Tuk on census day is given as 15, but could be any number from 11 to 19. A comprehensive assessment of the quality of census data collected on a 100% basis can be found in Statistics Canada's publication Data Quality - Total Population.

Birth and death information comes to GNWT Bureau of Statistics from the Registrar of Vital Statistics. Available migration data includes interprovincial migration of children in the Family Allowance program (form F-59), new registrants to the NWT Health Care Plan, and school enrolment information.

2. URBANIZATION AND INDUSTRIALIZATION

2.1 THE ISSUES

There is no doubt that the most pervasive cumulative effects in the region are increasing urbanization and industrialization. This trend accelerated in the early 1950s with the movement of previously nomadic native people into settlements, and their gradual adaptation to a more urban lifestyle. The primary instigation of this urbanization was and is government, with programs designed to improve health, education and housing standards. One consequence of these programs has been the concentration of population into communities, where the programs could be centrally administered and which had sufficient population to make economic use of the facilities provided.

Urbanization is now continuing with the industrialization of the north, represented by the oil and gas developments, new roads, possible pipelines, new commercial businesses, more air traffic, tourism etc. In short, the landscape of the region is changing from a few isolated communities to one of interspaced resource-extracting and supporting activity, with attendant growth in existing towns and hamlets, now linked by new roads, higher volume on shipping and air routes, and new communication networks, both land-based and satellite.

Many people, native and non-native, are strongly aware that, although these changes may be incremental from year to year, over the last three decades they have resulted in profound changes in the northern way of life. They are concerned that the

pace of change may accelerate even more as oil exploration changes to oil production.

The combined processes of industrialization and urbanization are now totally intertwined. To divide the topic into manageable proportions this section looks at region-wide effects. The next chapter looks at social and economic changes occurring within communities, which are called municipal issues.

A major concern is that people want to know in more detail what industrial activities will be occurring in the region generally, and specifically in their areas, during the coming year and in the future. This is true not only of new drilling activities, but of shore-based camp, transport and storage facilities, seismic lines, and other forms of industrial activity. A monitoring team should assemble this information from the Canadian Oil and Gas Land Administration (COGLA). It appears that the people of the region would appreciate receiving this information periodically, all in one place, and from a neutral source.

An important measure of industrialization/urbanization is improved transportation linkages within the region and with the rest of the world. For many people this is a good thing, but for some others it is a mixed blessing insofar as it brings in negative cultural and physical influences, and outsiders as well. Without passing judgement it is useful to monitor changes in transport patterns.

In terms of people-moving there is no doubt that air traffic is critical to the growth and development of the north, and a very good measure of changes in the rate of

industrialization. At Tuktoyaktuk, for example, annual aircraft movements have increased from about 6,400 movements in 1976, to about 25,000 movements per year at present. Forecasts are for 60,000 annual movements in 1988 and 85,000 in 1998 (Transport Canada, 1983). In Inuvik from 1975 to 1981, on the other hand, total aircraft movements declined from nearly 40,000 to about 27,000 in 1980, but went up again to 30,000 in 1981 (Transport Canada, 1982). Aklavik, by way of contrast, had less than 3,000 aircraft movements in 1981. In terms of these aircraft movements, Transport Canada expects that Tuk will be the busiest airport in the region for the foreseeable future.

Aside from volume of movements as a measure of industrialization, the issues related to air traffic at Tuk are most dramatic. The proportion of industry-related air traffic activity at Tuk is more than 85% of the total at present, and may rise to more than 92% in the future. For the local people there are two issues at work here. First, they suffer the environmental effects of aircraft movements, especially noise and dust. Second, and to compound the first, they have no access to the Boeing 737s and Electras which whisk southern-based workers to Calgary. At present Dome's 737 makes 7 trips per week to Tuk in the summer, and 20-30 per week are forecast in ten years time. In addition, Esso flies a regular Electra service, Gulf uses a charter 737 service, and cargo-bearing Hercules are frequent visitors. Tuk residents, on the other hand, only have access to Inuvik and beyond by Twin Otter on the scheduled services. In terms of noise, aside from large aircraft, there may be as many as 7 helicopters in the air around Tuk in any one

hour.

Aircraft movement statistics can be readily monitored for all airports in the region, with direct oil-related activity separated from non-oil-related activity (see discussion below for terminology). Airports monitored should include the ice-airport at McKinley Bay, Town of Inuvik airport, and the Shell Lake float plane base.

Another measure of social change is road traffic volumes, especially after the opening up of the Dempster Highway, as anyone familiar with Inuvik can tell you. Road traffic may increase dramatically again when an all weather road to Tuk is built in the future. The only systematic recording of traffic movement in and out of the region is for traffic on the Peel River ferry during its five months of navigation. This information is broken down by type of vehicle, eg. light passenger, commercial etc. Some measure of intra-regional traffic flows is available from Arctic Red River ferry vehicle numbers (a glance at the map shows why). The seasonal limitations of this information are discussed below. Finally, a useful indirect measure of urbanization is vehicle registrations, which are available on an annual basis.

Another useful measure of industrial activity would be cargo movements into the region via barge, air, and truck. However, accurate information on truck traffic, either numbers or volume of cargo, does not appear to be available at present. As truck traffic is taking over some barge cargo, and as the balance between air and truck changes yearly, there doesn't appear to be a reliable indicator as yet. Perhaps a weight

station on the Dempster Highway might help as a useful source of information. In addition, for those outlying communities which rely extensively on barge service, the cargo volumes may be of interest.

Finally, people are concerned, positively or negatively, about an increased flow of tourists into the region. Information on numbers of tourists is sketchy and numbers of vehicles crossing the Red River can serve as one loose proxy for this. Other possible sources of tourism information are given in the discussion below.

2.2 THE INDICATORS

Description of industrial activities in the region

Aircraft movements (per community, and divided as to local, itinerant general aviation, and itinerant air carrier)

Number of vehicles carried on the Peel River crossing (per category of vehicle)

Number of local vehicle trips (to and from Inuvik in summer and winter)

Vehicle registrations (per community per category of vehicle)

2.3 THE SOURCES

Canadian Oil and Gas Lands Administration
Yellowknife X1A 2R0
Telephone: 920-2100

DIAND
Box 2100
Inuvik X0E 0T0
Contact person: Rudy Cockney, District Manager
Telephone: 979-3361

Highways Section
Department of Public Works
Inuvik
Contact person: Guy St. Andre
Telephone: 979-2040

Aviation Statistics Centre
Statistics Canada
Ottawa, Ontario K1A 0N9
Contact person: Doug Chapman
Telephone: (819) 997-1385

Tuktoyaktuk Airport
Tuktoyaktuk
Contact person: Barry Roste, Airport Manager

Marine Operations
Highway Division
Department of Public Works
Yellowknife X1A 2L9
Contact person: Dave Buchan
Telephone: 873-7801
(ferry information)

Department of Justice and Public Services
GNWT
Court House Building
Yellowknife X1A 2L9
(vehicle registrations)

2.4 DISCUSSION

In aircraft movement statistics "local" means short local flights, usually helicopter movements. "Itinerant air carrier" refers to commercial scheduled flights. "Itinerant general aviation" combines charter, private and government flights. The airport manager at Tuk can help determine the percentage of non-related oil traffic. "Enplaned and deplaned" passenger volumes are also available for all airports. However, this information probably doesn't contribute much more to our understanding of trends, and is left out in the interest of simplicity.

Vehicle categories on ferry crossings can be combined into three simple categories: light vehicles including campers and

pickups up to 1 ton, commercial vehicles, and buses. Because of the location of local communities relative to ferry crossing points only vehicles coming from outside the region use the Peel River crossing. These numbers can be subtracted from the Mackenzie River Crossing totals to give local trips originating in Fort MacPherson and Arctic Red River. Obviously the ferry only runs five months of the year and so the figures are useful only as relative measures. Statistics on ferry crossings go back to 1978.

There are no records as yet on travel on the ice roads in the Mackenzie Delta. However, plans have been made to place traffic counters on the winter roads to Aklavik and Tuk. This may prove a useful source of data in future. The information would be available from the Highway Section of N.W.T. Department of Public Works in Inuvik.

It should also be noted that N.W.T. Highways maintains year-round traffic counters on the Dempster Highway at three points. They are: James Creek near the Yukon/N.W.T. border, Fort McPherson, and on the outskirts of Inuvik. These counters keep a 24 hour count of traffic on the highway. A review of the traffic counts could likely provide some insight into traffic flows between places such as Fort McPherson and Inuvik. Again, further information on these traffic counts can be obtained by contacting the Highway Section in Inuvik.

Vehicle registration information is available in 15 categories. The main categories are: passenger, taxi, station wagon, motorcycle, bus, truck, truck tractor and trailer, construction, and rental.

Other rough proxies of the number of tourists visiting the region include statistics on the number of Atlas Tours' tour parties visiting Inuvik each summer, the number of parties signing the visitor's book in the Catholic Church's small family hall, the number of parties served by the WAVA visitor booth in the lobby of the Eskimo Inn and the observations of the Managers of the two hotels in Inuvik. Similar proxy data could likely be obtained by talking to the management of the two camp facilities that provide public accommodation in Tuk: Tuk Enterprises, and BeauTuk Marine Services (ref., Greenall, 1984).

3. MUNICIPAL ISSUES

3.1 THE ISSUES

At a political level, the main issue for communities faced with new industry is the strategic choice of whether to welcome industrial expansion and population growth, to keep growth areas separate and isolated from the community, or to oppose growth altogether. The hamlet of Tuktoyaktuk, for example, has developed a community plan which emphasizes the community's desire to be physically separate, and shielded, from the impacts of oil and gas-related industrial development. Other communities in the future may face a similar choice about whether they wish to maintain their current lifestyle and size, or whether they wish to allow or encourage growth. Inuvik, for example, would like to encourage managed population growth and business development. In addition to monitoring current and potential population growth (see section 1) it would be useful to monitor the amount of land in and near each community given over to commercial and industrial uses, or likely to be so in the near future. Some political control may then be exercized in terms of zoning, land use applications, and subdivision control, and the selling and leasing of land.

The effects of growth and change on the provision of municipal services is also of concern. There should be a brief annual report on the state of settlement, hamlet, and town finances, especially capital budgets for additional municipal services, and the source of those funds. In addition, the debt load of Inuvik can be monitored. Roads may require upgrading and

reconstruction because of heavy industrial use, and/or increased local use. Where this is the case the supply and cost of gravel, and the environmental acceptability of digging it, becomes an important community issue.

Both the adequacy of water supply and of sewage disposal facilities are long-standing community problems. Existing problems may be increased by population growth. Water supply must be planned to meet increased demand locally and from industry. With or without industrial growth there is increasing dissatisfaction with inadequate sewage facilities (i.e. breaking "honey-bags"), and where these occur there is a real health hazard. Solid waste disposal is of great concern in terms of finding adequate locations, which satisfy environmental standards, given the difficulty of disposing of garbage in permafrost. Where industry is present there is the added concern of the disposal of possibly toxic industrial wastes.

Other municipal facilities which may need to be added or expanded in times of population growth are schools, fire services and recreational faciltiies such as community hall, curling rink, swimming pool etc.

Related to the physical needs for increased service levels, is the issue of who foots the bill. Inuvik and Tuktoyaktuk are concerned about the adequacy of their potential rate bases, and whether industrial development projects will be included in their rate structure and/or within their municipal boundaries. Also increased usage of all facilities means increased maintenance/operating costs, as well as possible capital expenditures.

There is a more generalized concern about the administrative capacity of representatives of small communities to attend to the numerous issues, and attend the numerous meetings, related to possible resource developments. Even the time of the most talented people in each community can be stretched thin by all the demands made on them by the more complicated local administration required to deal with growth and industry. This is as well as the numerous committees, advisory groups, and government commissions to be attended. In some cases too, able people may be away at work on the oil rigs. There is no ready measure of these concerns, unless one were to begin counting the hours, days and weeks spent in meetings related to oil and gas developments. It would be many hours indeed!

There is a last concern, also unmeasurable. This is that industry does not pay sufficient attention to the policy statements of community level government and community groups. For example, both the Hamlet of Tuktoyaktuk and the Delta Dene Regional Council found serious fault with industry's E.I.S. in this regard. These local levels of government feel that their policy statements are entitled to the same degree of attention as those of more senior levels of government.

3.2 THE INDICATORS

Report on municipal budgets (per community)

Debt load of Inuvik

Land area given over to or designated for commercial and industrial usage (in or near each community)

Report on condition of community roads

Report on adequacy of water supply

Supply and cost of gravel (per community, with a brief report on environmental considerations)

Report on adequacy of solid waste disposal

Number of houses with gravity sewage, holding tanks, or bagged sewage (as a proportion of the total in each community)

Report on adequacy of fire services

Report on adequacy of recreational facilities

Number of oil and gas related meetings, and number of hours spent in meetings

3.3 THE SOURCES

Department of Local Government
GNWT
Inuvik X0E 0T0
Contact person: Charles McGee, Regional Superintendent
Telephone: 979-7120

Town of Inuvik
Contact person: Tom Detlor
Telephone: 979-2607

DIAND
Inuvik
Contact person: Rudy Cockney, District Manager
Telephone: 979-3361

Community services information may be supplemented by:

Water and Sanitation Section
Department of Local Government
GNWT
Yellowknife X1A 2L9

All this information must be supplemented by first hand information provided by the governments of the communities, community delegates to meetings, and municipal counsellors.

3.4 DISCUSSION

Many of the above indicators are somewhat difficult to quantify, nor are there necessarily agreed-upon municipal service standards applicable in the Arctic. Operating and/or replacement costs are periodically estimated by consultants (see, e.g., Manecon 1980, Dillon 1981), and these can be used to update the information contained in Community Water and Sanitation Services (Department of Local Government, 1981). However, for up-to-date and accurate reports on municipal infrastructure related to current thinking on northern standards and problems, the monitoring team is advised to consult Department of Local Government officials in Inuvik and Yellowknife, as well as representatives of community governments. They will be best able to interpret what quantified information is available in light of local knowledge of the communities, and of constraints particular to these northern communities.

4. WAGE EMPLOYMENT

4.1 THE ISSUES

It is in the area of wage employment (and northern business development, see next section) that most monitoring activities to date have been focused. The reason is that government, industry, and local and regional citizens' groups, have all expressed a strong interest in increasing northern participation in the wage employment. This is not surprising since employment, vocational training, and business activity are by far the main northern benefits of industrialization. Through the legal requirements of COGLA for socioeconomic monitoring of northern benefits, and through the "action plan" or socio-economic agreements with the GNWT, industry is committed to providing annual information to government in the areas of: positions filled by northerners, home community of employees, turnover rates, and employee training and apprenticeship programs.

It seems the overall issue with regard to wage employment has to do with the lack of a systematic approach to manpower planning for the region, in terms of matching manpower requirements to a regional labour profile. In other words, answering these questions on regular basis: what categories of jobs and how many of each will be available to local residents over the time period required to prepare those residents to fill the jobs?, and, how many residents are available for what kinds of employment?, and what are their employment aspirations? Such questions can only be answered by joint government/industry activity, beginning with a regional labour force inventory.

Although the commitment of industry to northern employment is clear, it is very difficult to judge the efficacy of their diverse efforts in the absence of background information. It is also difficult to evaluate the annual reports on the matter, given a dearth of information on both supply of, and demand for, employment, and the relationship between the two.

What complicates the whole issue further is that while some of the local labour force is content with entry-level employment, others are looking for career opportunities. This generally means a relatively long-term commitment to educational upgrading and vocational training. As the Sachs Harbour Hunters and Trappers Association (1983) put it "too often natives are hired to work as labourers or helpers to tradesmen - we are tired of being second class employees". Certainly if native people are to participate in an industrialised economy at higher than the bottom rungs on the ladder, then the importance of education and training become paramount. These commitments can require considerable leadtime for manpower planning efforts. There are of course numerous valuable training efforts going on, at Tuk Tech, and in apprenticeship programs, and sponsored by GNWT's Department of Economic Development and Tourism, Department of Education, by CEIC's Canada Employment Centre, and by the oil companies. A recently organized coordinating committee of the above may, in the near future, be assessing the integration and usefulness of these efforts in light of a regional manpower development policy, and generating statistical criteria for evaluating the meaning of these socioeconomic changes to the residents of the region, especially native

residents.

CEIC outlines the components of a manpower plan:

1. manpower development plan:
    a. labour requirements
    b. labour supply sources
    c. identification of imbalances
2. strategies to overcome imbalances:
    a. recruitment
    b. training
    c. foreign investment

What tends to be reported is 1a from the above, but not 1b or 1c. Further, what information is available on point 2 is not put in terms of a strategy or a policy for solving 1c. In other words, while there is a clear commitment from all parties to a northern employment policy there is no systematic, measurable criteria for knowing if such a policy is successful.

The purpose here is not to belabour the point, but to suggest that in terms of cumulative monitoring, we are hampered by this piecemeal approach to labour planning. Further, if we are to accept that employment, training, and new business are the main (some would say only) benefits of industrialization, we see the importance of useful information. From the monitoring perspective, the current flow of information doesn't provide us with any reference points or criteria by which to judge employment benefits in terms of local aspirations.[1]

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[1] In social scientific terms, the northern-hire policy has not been "operationalized".

Related to this is a rather contentious definitional problem, that is, what constitutes a "northerner" or a "northerner employee"? Definitions range from one year residency (Gulf) to two years (Dome) to five to ten years (native groups). A standard definition may be required.

Perhaps even more problematic is the general lack of information on employment of northern natives, which is mostly unrecorded. If there is a policy to encourage or assist native employment then information on native employment must be collected. Arguments against so doing are weak: natives aren't the least bit stigmatized by being natives, and although it is illegal to discriminate at the time of hiring there is no law against recording information on either numbers of native employees or available native skills. Also affirmative action programs directed at specific target groups are considered to be non-discriminatory in law, and as such the keeping of records to facilitate their evaluation is valid.

Nor is there any substance to the argument that you can't tell who is a native or who isn't. Certainly Inuit, Dene and Metis alike are proud to claim their heritage. Also, Statistics Canada, Health and Welfare Canada, and GNWT Social Services all manage to define ethnic origin without problem, as does one of the three major oil companies. This is important because native people are concerned about a) job competition from southerners in times of high unemployment and b) the effects of systematic discrimination against them in terms of pre-set minimum educational standards as a prerequisite for employment. Perhaps these minimum educational standards should be reviewed in the

northern context by a joint industry, government, and union body to ensure realism rather than an artificial control of supply.

Also from the cumulative monitoring perspective it is important that all employment opportunities be evaluated in terms of the northern residency policy. There is some concern that with the focus on the efforts of the big three oil companies, the cumulative northern employment possibilities of numerous contractors and sub-contractors are being lost. Perhaps after an employment monitoring framework becomes workable with the larger companies it can be extended incrementally to include other contractors and sub-contractors.

Another concern is the high native drop-out rate from both training and employment, although this appears to be decreasing. There should be more focus on work persistence and the (real rather than stated) reasons for termination. This may require the use of skilled exit interviewers. Also, information on the experiences of local, and especially native, persons in employment could assist in the design and evaluation of training and other manpower programs. The continuity of training programs could also be monitored.

Another issue, raised again and again in discussions, is the effects of wage competition on other employers in the region. Numerous government and administrative agencies at all levels from band councils and hamlets on up, expressed an inability to get or keep good employees in the face of the very high wages on offer from industry. The number of such vacancies could be monitored, although the problem is not one which lends itself to a ready solution.

Finally, the oil companies themselves have some concern over a lack of feedback on their action plan proposals, and the lack of coordination between federal and territorial efforts at job creation. This again suggests the need for a more coordinated policy effort in this area.

4.2 THE INDICATORS

POSSIBLE EMPLOYMENT AND TRAINING:

Projected manpower requirements by location (for all relevant employers and including realistic minimum skill requirements and duration and timing of opportunities)

Resident labour force availability (by community including present skill level and requested further training).

Projected manpower training requirements and proposed manpower training program (by location of training and type of program)

CEIC registrations and placements (by home community)

EXISTING EMPLOYMENT AND TRAINING:

Positions filled by northerners (by occupational category, skill classification, home community, and as a ratio of available positions)

Number of native employees (as above)

Number of female employees (as above)

Northern employee weeks worked (by occupational category and as a % of total weeks worked per category)

Northern native weeks worked (as above)

Reason for termination (by job category, home community, and ethnic origin).

Numbers of northern trainees (by community, by type of course/program, funding and sponsorship of program, with outcome upon completion)

Number of native northern trainees (as above)

Reason for non-completion (by home community and ethnic origin)

Report on the patterns and methods of job advertising

4.3 THE SOURCES

Department of Economic Development and Tourism and
Department of Education
GNWT
Yellowknife

CEIC Regional Office
Yellowknife

Canada Employment Centre
Inuvik

Canada Oil and Gas Lands Administration
Ottawa

4.4 DISCUSSION

Although the agencies listed above are the channels of information into the monitoring program, it goes without saying an important original source of information is the private sector. It may occasionally be necessary to verify the accuracy of the information provided by industry by independent survey, and to query definitions and categories, for example, of a "northerner".

In the absence of information which links trainee positions with actual hirings, and with work records and/or terminations, it is perhaps more useful to monitor northern and native employee person-days or -weeks worked per job category per month in addition to the gross number of hirings per se. This goes some way towards reducing problems of double counting of employees rehired, and when compared also provides a better measure of northern and native participation in the labour

force, since it is indicative of duration of employment as well as hiring. It is not however to be interpreted as either indicative of the quality of work environment nor of the reliability of employees. Over time it does impart some information on the match of northern employees to employment.

For review purposes it would be helpful if employment categories were also divided into broad skill categories: unskilled, semi-skilled, skilled, administrative, clerical, etc.

Finally, it is also important to note that different people, each with extensive experience in manpower planning and/or detailed experience in the Arctic, hold widely varying opinions on the possibility of undertaking such planning and of getting data adequate for the task. These opinions range from the view that adequate planning is a function of political will and money, to the view that manpower planning is virtually impossible in this context (or as one respondent put it "pie in the sky"). Perhaps a review of the utility and problems of the TERIS program will be helpful on this point.

5. BUSINESS DEVELOPMENT

5.1 THE ISSUES

Related to the northern employment policy is a general commitment to promote northern business. A lot of money is involved. For example, during the period covered by the current exploration agreement (1982-87) Dome is forecasting expenditures of $969 million. In 1982, Dome paid an estimated $24 million to northern locally owned businesses for providing goods and services to the Beaufort operation. An additional $25 million in expenditures will be paid to southern based companies with branch operations in the north. And there are many other companies, and contractors and sub-contractors, involved in buying goods and services.

There is every indication of an increasing involvement in business activities on the part of native groups, and of an increasing sophistication in the types of businesses undertaken. For example, the Inuvialuit Development Corporation started in business in 1979 with Delta cabs of Inuvik. In just four years time they are now involved in commercial aviation (Aklak Air), food distribution (Ulu Foods), guided Arctic expeditions, marine services to the oil industry and joint venture drilling (Atco-Equatuk). The Inuvik Dene Band is now in partnership with Northern Metallic Ltd. supplying specialized industrial supplies for oil field, mining, and pipeline use. And the Fort McPherson Incorporated Band Ltd. has signed contracts with the GNWT to maintain the Dempster Highway from the Yukon/N.W.T. border to Arctic Red River, and to provide maintenance and upkeep service

at Nutuiluie Territorial Park. In Aklavik, Fabric North Ltd has recently completed a contract for Esso to provide the bags used to construct artificial islands in the Beaufort. These are just a few examples and there is no doubt that native people wish to expand their level of involvement and to reap some of the benefits of development. The same is true, of course, of non-native business, and the potential for small scale initiatives. Business activity should be evaluated on sector-by-sector basis, and for each community to determine if business activity was being spread over all sectors, or concentrated in one. In addition to gross number of dollars injected into the regional economy, the value added by regional businesses should also be calculated, since many dollars introduced into the region quickly flow out again. Also the number and amount of loans and loan guarantees made to small businesses by the GNWT and DIAND may be a useful measure of economic activity.

While industry, government and native and non-native citizens groups are all supportive of the promotion of northern business, there are a few issues. There is concern over how a northern business is defined, and a worry that southern businesses will masquerade as northern businesses by opening up a token office, or nominally subcontracting on paper through a northern company. However, GNWT Economic Development and Tourism and the Bureau of Statistics are now keeping a register of bona fide northern businesses, as part of their own northern preference policy. This may help.

There is also concern about the fact that many contracts which are far too large for northern bids, could perhaps be

broken up into more manageable segments. Others are worried that they don't have the cash flow to put up performance bonds, or to weather the normal delays in payment of bills. While these are real worries, it also seems that northerners are increasingly sophisticated in their business dealings and can overcome obstacles as necessary with varying levels of supporting programs to facilitate participation. Finally there is concern about the adequacy of industry consultation programs with local business, and hope for increased technology transfer through joint venture efforts.

5.2 THE INDICATORS

Dollars injected in the regional and communities' economies through direct purchase of goods and services

Regional value added by northern businesses

New business: gross revenue and employment created

Existing businesses: gross revenue and employment created

Ratio of dollars to regional businesses as a percentage of all contract dollars paid

5.3 THE SOURCE

Department of Economic Development and Tourism
GNWT
Inuvik Office
Yellowknife Office

Department of Indian Affairs and Northern Development
Inuvik Office
Yellowknife Office

5.4 DISCUSSION

In addition to statistical information the monitoring report should discuss initiatives by industry and government to assist in regional business development.

It should be noted that the Department of Economic Development and Tourism is a secondary source with respect to most of this data. The prime source is the oil and gas industry on a company-to-company basis. As noted previously, there are no procedures in place to cross-check the validity of the information provided by the various companies. This would seem to be a matter of interest. The number and amount of loans or loan guarantees that are being provided to businesses in the region is readily available from the Department of Economic Development and Tourism, Yellowknife. However, it is not complete. The Department of Indian Affairs and Northern Development through its various initiatives in support of the economic development of Dene Bands also makes funds available to small business enterprises in the region. The Superintendent of Economic Development for the Inuvik area of the department can make such information available.

6. PRICES AND INCOMES

6.1 THE ISSUES

There is concern about the cost of living in the communities of the region, and some question as to whether the coming of industry and increased levels of wage employment might cause a price inflation damaging to those on fixed incomes. Fortunately the GNWT Bureau of Statistics has recently published a Food Price Index based on the price differentials between each community and Yellowknife in 1982. In addition, they make available a Living Cost Differential index for each community based on Statistics Canada's Isolated Post Index which compares each community with the base community of Edmonton every five years.

In terms of incomes the average income per year for each community is available. Although of relatively limited value for reasons discussed below, it can serve to highlight differentials among communities in the region and between communities and the rest of the NWT and Canada.

A report prepared recently for the Delta Dene Regional Council (Jackson and Trudeau, 1983) points out that average personal income per NWT community declines as the proportion of Dene to the total population increases. However, whether this is good or bad depends on whether the time spent not in wage employment is spent in voluntary non-wage activities, or in income generating activities (i.e. trapping) which offers other than solely financial satisfaction. A more clear issue highlighted by this report is the disparities in disposable

personal income between men and women, especially given the numbers of women who are single parents.

6.2 THE INDICATORS

Food Price Index

Living Cost Differential

Average Income (by community by sex)

6.3 THE SOURCE

Bureau of Statistics
GNWT
Yellowknife X1A 2L9
Contact person: Nunda Rao
Telephone: 873-7653

6.4 DISCUSSION

The isolated-post Living Cost Differential Index is not updated annually. The index, for example, is now available for the years 1973-77-83, which is sufficient to demonstrate any trends. More frequent computation may be available in the future. There are no plans at present to update the 1982 Food Price Index.

The living cost index encompasses price comparisons for such items of consumer expenditure as food consumed at home, household supplies and services (including communications), personal care supplies and services, public transportation, private vehicle operation and maintenance (including snowmobile and/or boat operation), and tobacco and alcoholic beverages; some 225 priceable items form the sample. Each price comparison

at the item level is aggregated so as to reflect the relative importance of goods and services purchased in Edmonton. Several important components of the typical family budget such as shelter costs, clothing costs, vehicle purchase costs and restaurant meal costs are not included in the measurements.

Income statistics can be based partially on General Individual Income Tax Returns. Income includes income from wage employment and self-employment, the latter now supposed to include trapping income. Welfare payments are not included, nor obviously is income-in-kind, for example, from hunting or fishing. The average incomes for each community may well include a very few high earners (teachers, government employees, oil company employees) and many more very low earners in what are called "unclassified occupations". The figures say nothing whatever about the income of any member of the community. It should also be noted that average income data disaggregated by sex is not available for some smaller communities.

The information from tax returns could be supplemented through listing the social assistance payments made by category on a community-by-community basis, by obtaining the amount of trappers assistance payments and trappers assistance loans paid by the Department of Renewable Resources on a community-by-community basis, and by making a rough estimate of the value of the income in kind derived from hunting and fishing in the region. The latter, of course, would be a very crude estimate but it seems inappropriate to leave it out entirely.

7. RENEWABLE RESOURCE HARVESTING

7.1 THE ISSUES

There is a keen interest on the part of many people in the region in understanding changes in the amount and viability of renewable resource harvesting by native people. Such harvesting refers to hunting, fishing, and trapping for money and/or as a source of country food. There is no doubt that these activities play an important part of life in the region. Last year sales of fur from the region exceeded $1.2 million and country foods still had a significant role in people's diets.

Each community in the region has an individual pattern of harvesting wildlife. In Tuk, for example, the main fur animals hunted or trapped are white and coloured fox, polar bear, marten, muskrat and wolf. In addition, fishing and whaling are important to Aklavik, Inuvik and Tuk. In Fort McPherson and Arctic Red River hunting and trapping are an important source of food, and cariboo and moose are the main game animals taken, as they are for Inuvik and Aklavik. Sachs Harbour is noted for its expertise in hunting the white fox, and for conducting musk-ox and polar bear hunts. Paulatuk makes use of a wide variety of land and marine animals. The point here is to emphasize the physical, economic and cultural importance of renewable resource harvesting to each community in the region.

The relationship among renewable resource harvesting, wage employment, and the transmission of native culture from one generation to the next is little understood. Some people argue that wage employment is complementary to renewable resource

harvesting in that it provides the necessary capital for equipment: traps, rifles, snowmobiles, gas, ammunition, etc. Others argue that an increase in wage employment results in a decline in interest and ability for hunting and trapping. Some people in the communities are concerned that hunting and fishing are becoming more of a weekend sport pursued in fast boats, even by natives, and foresee competition between weekend sports hunters and people who wish to pursue the more traditional patterns of harvesting from camps. Also it appears that hunting for subsistance purposes may be giving way to new purposes which treat hunting and outfitting as a form of commercial activity. This is reinforced by the business promotions of native groups like COPE, which would like to encourage commercial use of the renewable resources by native people.

There are other issues. People are worried about competition from non-native harvesters who might migrate to the region. There appears to be an increasing number of complaints of trapline interference to wildlife officers and the RCMP, although it is not clear that the culprits are non-native.

There are important intangible issues related to the social and emotional significance of hunting and trapping. Native people have traditionally placed high value on hunting, and the successful hunter derives considerable self-esteem as well as esteem in the community and in the family relationship. Some people are concerned about a lack of transmission of harvesting skills to younger generations, and wonder if wage employment, often at the bottom of the skills ladder, can replace harvesting in people's lives. Will northern industrial jobs provide self-

esteem as well as a pay cheque? Do native people care about subsistance activities when they can make $3500 in two weeks on an oil rig? The evidence and opinion is conflicting but the questions themselves are critical and largely unaddressed. Finally a decline in the use of country food, and its substitution with "junk" food, is recognised by community nurses as contributing to vitamin deficiences and tooth decay.

Unfortunately, the available statistical information on this topic is also conflicting and meagre. To understand renewable resource harvesting there needs to be adequate information on the resource base (i.e. the animal and fish populations) and on harvesting activities. For the former this means information on population, distribution, generation time, life span and migration patterns - a difficult task at best. On the harvesting side, there are two problems. The first is how to value harvest information, and the second is problems with available statistics.

There are two basic evaluation techniques. One is to value renewable resource harvests at their local market price, which is easy for tradeable furs but difficult for country foods where no real cash market exists. The second approach seeks to establish a substitute or replacement value in terms of what similar food would cost at the nearest store, adjusted for protein content. Both approaches require a good data base, which often doesn't exist. Also reducing what may be a culturally significant activity to a simple dollar value ignores the serious intangible issues discussed above. In any event, it appears that the domestic value of country foods is unknown, but

the income in kind generated is still of considerable importance. Certainly if game becomes scarce in an area, local people are likely to take a sharp decline in living standards in that caribou is unlikely to be replaced by expensive imported beef but more likely by lower protein substitutes like macaroni.

Probably the only really useful information currently available is the annual fur return summary for the region. This gives, for each community, the number of pelts of each fur-bearing animals purchased and the dollar value of that purchase. (However, see the cautionary note in discussion below.) Of course the potential of what might be earned from trapping depends not only on the trapping effort but upon fur market prices and the population status of the fur species. In addition information on the numbers of actual trappers operating in any year can be obtained through discussions with the Hunter-Trapper Associations.

A second source of information is based on General Hunting License Returns (GHLs). The sheer numbers of GHL holders may be of some use in assessing levels of hunting activity. In terms of harvests the GHLs are the only available source of information. For example, Dickenson and Herman (1979) demonstrate an apparent decline in moose numbers in the Mackenzie district based on GHL returns. They note that GHL returns do not include sex or age of animals killed, and it is therefore impossible to draw inferences about population structure. In addition, GHL harvest statistics are based on hunter's self-reporting and there is general agreement that these reports are probably underestimated.

In conclusion, few harvests can be monitored with any accuracy. Further progress in measurement may be forthcoming from harvest data collection programs jointly mounted by GNWT Renewable Resources and DIAND.

There is a larger issue, however. One perspective on renewable resource harvesting is that it affords native people with the opportunity to be in control of their livelihood and to experience cultural continuity. In this sense there is no dollar value for resource harvesting. In terms of the wage economy, and probably boom-bust business cycles, Brakel (1977) reminds us of the important function of renewable resources as a form of savings and insurance against the day when non-renewables are no longer viable. Wildlife therefore has served as a guaranteed source of economic survival given that the population is not excessive for the land base. It appears that institutionalizing native peoples' access and control over this resource may only come about with a settlement of land claims.

7.2 THE INDICATORS

Number of pelts (by type by community)

Price paid for pelts (by type by community)

Numbers of active trappers (by community)

Numbers of GHL holders (by community)

Number of complaints of interference to traplines

7.3 THE SOURCE

Department of Renewable Resources
GNWT
Inuvik X0E 0T0
Contact person: Doug Stewart, Regional Superintendent
Telephone: 979-7200

7.4 DISCUSSION

There is very little reliable information which would permit monitoring total harvest and value of game, birds and fish for each community. What data are available primarily relate to fur-bearers, collected for purposes of Fur Export Tax Returns and Individual Trapping Record Summary. These do not include furs kept for personal use and so there is slight underestimation. Big game reports from GHLs probably involve moderate underestimation at best, but for seals and migratory birds the underestimation is very large. Small game, marine mammals, and fish taken for domestic use are unrecorded except for information on the Beluga whale harvest available from Fisheries and Oceans in Inuvik.

There have been some estimates of the value of subsistance hunting of game hunt which put the economic value at from 1.2 to 3 times the value of the fur harvest (Gerein, 1980). This is of course a rough estimate.

It should be noted that the Inuvik Office of the Department of Renewable Resources maintains information on a Wildlife Office-by-Wildlife Office basis on the number of complaints of trapline interference received and the number of investigations carried out. It is possible to identify the number of complaints or investigations relating to industry matters from the data.

Additional information on this subject is available from the Superintendent of Renewable Resources in Inuvik.

It should also be noted that the community-by-community information on fur sales may be misleading. The Inuvik sales statistics, for example, often reflect the fur sales of trappers from the Anderson River area and from communities with a road connection to Inuvik such as Arctic Red River. Moreover, some of the more active trappers in the area have long followed the practice of sending their furs out for auction in the southern fur markets. Their activities are not reflected in the available data.

towards new governmental structures, both regionally (Nunavut and Denendeh) and municipally (native/non-native community governments, transition to hamlet status). These issues concern the control or involvement that local communities have over the budget, scope, and delivery of government services; and the number of government functions managed in, rather than out of, the region. The rate of local participation in local government is also of interest, for example, turnout in local elections, and the turnover of councillors on an annual basis. A brief synopsis of such developments should be reported.

A further measure of local control is the extent of participation of native people in decision making about, and in the delivery of, government social and economic services. The monitoring of the number of native government employees is recommended in each of the appropriate sections of this report, for example, teachers, social workers, health service employees, drug and alcohol counsellors, police etc.

8.2 THE INDICATORS

Brief report on progress in each relevant land claims negotiation

Brief report on moves towards new structures for regional and local government

Brief report on extent of regional/local control over management and delivery of services

8.3 THE SOURCES

Senior officials of the relevant native organizations

Department of Local Government
GNWT
Contact person: Charles McGee
Telephone: 979-7120
Inuvik

DIAND
Yellowknife

9. EDUCATION

9.1 THE ISSUES

The quality of education is a matter of great concern to many northerners, and there have been a number of crucial issues identified recently by the GNWT's Special Committee on Education (1981), especially related to native students. At the root of the main issues is the intense cultural tension betwen the land-based values of native lifestyle and the southern-oriented wage economy values of the dominant culture. The educational process in the NWT has tended to reflect the latter, alien as it was to the native way of life as recently as the late 1950s. The result has been a generation educated out of an old way of life without being successfully integrated enough to take on the competitive framework of the wage economy. The problem is highlighted by a phenomenal drop-out rate of most natives from schools, and ironically and cruelly, severe cultural dislocation and unhappiness for some of those who are relatively successful in the school system (see a subsequent chapter on juvenile mental health).

Of course while the educational system may well be faulty from the native perspective, it also becomes a scapegoat or a "front-line battleground" in the inevitable clash between the two cultures. As Alootook Ipallie puts it in Inuit Today (Spring 1982) "the authors of the present educational system have done their best to provide first-class schooling to the Inuit children, but it appalls us to know how much of a failure their well-intentioned programs have become". The tremendous task

facing the northern educational system is to provide an education that will allow northerners to participate in the political and economic systems of greater Canada without destroying the values, traditions and languages upon which rest the survival of distinct native cultures.

Unfortunately the formal education system is perceived of as being in direct conflict with a traditional way of life and associated values. The result is that a large number of native school age children do not remain in school to graduate from secondary school, or even pass the grade 9 or 10 level which is seen as a minimum for further training by industry. Nor are they encouraged to do so by parents who have had little or no contact with the educational system. Especially influential is the boarding school system by which all secondary school students must move to Inuvik, thus separating children from parents at a time critical for their socialization in land-based skills, and from their community at a time critical for the development of life value systems. Unfortunately economies of scale seem to dictate that high school students be centralized, especially where equipment is required for teaching. Perhaps this policy needs to be periodically reexamined.

In any event there appears to be a decline in respect for traditional values and practices, and yet the generally low levels of educational attainment make it difficult for natives to obtain skilled employment opportunities. For example, the Denendeh National Office estimate that 90% of Dene children entering Grade 1 fail to complete secondary school education (Jackson and Trudeau, 1983, p.7). The participation and drop-out

rates for children in the communities can be monitored. A related issue is the attendance of students in school, and whether parents are likely to encourage their children to attend. Attendance records are also kept and tablulated semi-annually by the GNWT Department of Education. Absences are recorded as either sanctioned "land days" or not. It would also be useful to report on the number of students who drop out of Samuel Hearne/Grollier Hall over the course of each year.

Where children do remain in school the cultural conflict is reflected in the two paramount concerns: transmission of native cultures and language, and availability of vocational training. Until the 1970s there was virtually no native content in the curriculum, and this contributed to a decline in traditional knowledge and skills. The situation is changing slowly as native people call for native grammar, composition, history and social studies to be taught alongside their Euro-Canadian counterparts. The development of new native cultural and skills programs, and new teaching materials, can be reported regularly, as can changes in the style of instruction towards one more based on the traditional acculturation process.

Two related matters could be monitored. One is a measure of the age of students by various grade levels in the schools in the region. If one wants to break out native versus non-native residents in calculating average, median or modal figures or selected grades additional insights could be provided. A second indicator that should be of interest would be the number of schools with courses or classes geared to the student who spends part of the year on the land with his parents and part (often a

very small part) of the year in the regular school system. Clearly, the task facing the northern educational system requires special provisions within the school system to accommodate those children who are attempting to straddle both the native and non-native way of life (Greenall, 1984).

In terms of language, there is only the beginning of a commitment to the development of native languages. This will be an uphill battle, coming as it does at the end of nearly two decades of discouraging native language, and in the face of the tremendous cultural power of live television, much of it in English (see next section). However, to counter these forces, COPE has put substantial effort into the training of native language teachers in recent years, and instructors are about to begin working in schools of the region. There are now fledgling language programs, for example, at Mangilaluk School in Tuk. The availability and apparent success of these language programs should be reported in a monitoring program.

One measure of the relevance of northern education will be the numbers of native teachers and classroom assistants, especially as non-native teachers' length of service in the N.W.T. generally averages only 3 years. There are few native teachers trained to the Bachelor of Education level, and even those natives who might wish to attend the Teacher Education Program (TEP, 2 years) are reluctant to leave their communities for extended training.

On the vocational side, there is increasing demand for school programs in the region to be related to opportunities for wage employment so that high school students can a) enter direct

employment or b) go on to technical or vocational education. Related to this is the need for adult education and skills upgrading to the grade 9 level required for further vocational training. Native groups are asking that vocational training at Thebacha College and Tuk Tech be supplemented by new programs in Inuvik. For any of this to take place however the Department of Education requires information on the considerable employment opportunities in the region. Admittedly, there is considerable uncertainty as to the timing and magnitude of many of these opportunities and it would seem that a modular approach to the development of increased vocational and post-secondary educational programs and facilities in the region would accommodate and allow adjustments to much of this uncertainty. Specific problems of manpower planning have been discussed under "wage employment". Enrolments in adult education can be monitored. Another useful indicator that should be monitored is the presence of an Adult Educator in a community and the availability of Adult Education facilities at the community level. It might also be useful to monitor the budget available for Adult Education in the region.

9.2 THE INDICATORS

Report on native skill/culture curriculum development

Report on native language training programs

Numbers of native classroom assistants (by school)

Numbers of active native teachers (by school)

Native people in B.Ed. programs (from region)

Native people in T.E.P. (from region)

Age of students by grade levels (by native and non-native)

Report on courses or classes geared to student who spends part of year on the land

Enrolments (per school, by ethnic origin, grade, sex)

Annual attendance summary (by school)

Grade 9 Graduates summary (by school, ethnic origin)

Grade 12 Graduates summary (by school, ethnic origin)

Student drop-outs from Samual Hearne/Grollier Hall

Enrolments in adult education

Availability of adult educator and adult education facilities (by community)

9.3 THE SOURCES

All quantitative information is available from:

Department of Education
GNWT
Yellowknife X1A 2L9
Contact person: Jane Pratico

Department of Education
GNWT
Inuvik X0E 0T0
Contact person: Ivan Fraser, Regional Superintendent

COPE
Inuvik
Contact person: Larry Osgood

All other information can be got by speaking directly to the principals of the 12 schools in the region.

9.4 DISCUSSION

Numbers of native teachers and classroom assistants can be compared to the total numbers of staff available in the annual "school facilities profile". Enrolment information can be taken

from the combined sources of "principal's statistical report and summary" and "headquarters statistical report and summary".

The "year end attendance summary" provides summary information for each school including possible total student-days, actual number of student-days, and land days. Further detail from the term summary includes percentage of students attending 25, 50, or 75% of the time or less.

10. THE MEDIA

10.1 THE ISSUES

Next to political control and education, the influence of the media, and especially television, may have a profound effect on cultural maintenance in the region. As a force for rapid cultural change, the world over, the influence of TV may be grossly underestimated. Live broadcasts in the north are very recent: the first less than a decade ago with the launching of the first Anik satellite, and only very recently in communities like Paulatuk. And yet, very quickly virtually every home in the region acquires colour TV and video equipment, once a signal becomes available. The vast majority of the programming is from southern Canada and the USA, and in the English language.

In addition to northern CBC-TV service, the local satellite receiving franchise operation provides a signal (on a fee basis) from a number of southern stations. In addition, residents in several communities have installed their own private receiving dishes and are able to obtain a wide variety of TV signals. In common with communities throughout the Mackenzie Valley some communities are considering installing their own community-owned receiving dish. There is also a widespread and pervasive influence of VTR movie tapes which are available on a rental basis from several outlets in Inuvik, and screened on home TVs. Boxes of such tapes are sent on a regular basis to communities throughout the region.

There are a number of possible ramifications of the spread of TV: a) the promotion of English language fluency at the

expense of a native language facility; b) the encouragement of southern-based values and consumption patterns; and c) substitution of TV-time for the learning of land-based survival and harvesting skills. On the other hand, northern people, like people all over the world, want to be linked in to international communication networks, and to learn and be part of this larger community. The Native Press (January 28, 1983) recently outlined many of the costs and benefits of television in native communities including the advantages of: less isolation, good educational shows, and less juvenile deliquency; and the disadvantages of: less native language usage, less talk itself, less play on the part of children, and lack of contact with the past by children through their elders.

The same arguments might be made about radio, newspapers and magazines, but with much less intensity because TV is such a beguiling medium. In any case, what is at issue is certainly not whether there should be mass media in northern communities, but to what extent it reflects and assists the values and aspirations of the recipient groups. This is a concern of many native people and they are beginning to press for more locally-originated programming, in native languages and in English. Although the process has moved faster and further in the eastern Arctic with the adver of the Inuit Broadcasting Corporation, the native people of the Beaufort region are increasingly asking for more locally relevant CBC programming and for more native produced programming. The process has also gone much faster with CBC Radio than TV, (45% local or regional programs) probably because of the length of time of radio service, the cost of

radio vs. TV production and the regional radio studio in Inuvik vs. satellite TV transmission from Toronto. In any event, the extent of native participation in both TV and regional radio should be monitored, both in terms of hours of programming and in terms of numbers of native employees of the CBC. Also the number of personal messages passed over the CBC-Radio Inuvik station to people on the land and in outlying communities may be an informal measure of the importance of local radio broadcasts.

In terms of northern newspaper readership, it would be simple and interesting to monitor the numbers of copies of northern newspapers sold in the region, including Inuvik Drum, Inuvialiut, News/North.

10.2 THE INDICATORS

Hours of regionally originated TV programming as a proportion of all programming.

Hours of regionally originated radio programming as a proportion of all programming

Number of native CBC employees as a proportion of the regional total

Number of personal messages sent over CBC-Radio Inuvik

Newspaper circulation in region

10.3 THE SOURCES

CBC Radio Northern Service
Inuvik

CBC-TV Network Control Centre
Toronto

Inuvik Drum
Inuvik

Inuvialiut
Inuvik

News/North
Yelowknife

11. WELFARE DEPENDENCY

11.1 THE ISSUES

One of the obvious cumulative impacts of urbanization and extension of government services into the communities has been the continual rise of welfare-dependency since the 1950s. While the number of recipients of social assistance appears to have levelled off recently, it is not dropping, at least in Tuktoyutuk (Nagora, 1983). At the same time, the actual expenditure on social assistance is continuing to grow. Some observers suggest this may be due to either an increased awareness of rights to social assistance, or to increased expectations on the part of the community as to standards of living and the consumption of consumer durables (snowmobiles, Betamaxes, etc.), whether one is in employment or not.

There are also additional factors to be considered. One is that certain recipients of social assistance are not capable of taking wage employment. One could triple the number of wage opportunities available and still have no impact on a small core of families and individuals with chronic and extensive social problems (Greenall, 1984). In addition, it must be noted that because of inflation social assistance payments cannot do anything but continue to grow. If one wants to gain insight into the actual trend, the social assistance payment data should be adjusted both to take into account inflation and the effects of community population growth.

In any case, there is considerable concern on the part of both native leaders and social workers to begin to reduce

welfare-dependency. The problem is that it is not possible to discriminate against families and individuals who are entitled as a matter of course to receive social assistance. Rather it is likely that reduced welfare-dependency will come about through the provision of more attractive forms of income provision such as wage employment or native business development, strict administration and revised policy related to eligibility for social assistance, and extensive counselling at the individual and family level.

11.2 THE INDICATORS

The following appear to be the only realistic indicators of welfare-dependency:

Length of time family or individual receiving Social Assistance (in months or years)

Total Social Assistance expenditures (by category of need by residence location)

Total number of Social Assistance recipients (by residence location)

Social Assistance recipients for economic reasons (by residence location)

Total amount per capita S.A. payments (by residence location)

11.3 THE SOURCES

Department of Social Services
GNWT
Inuvik
Contact person: Paul Donnelly, Regional Superintendent

Department of Social Services
GNWT
Yellowknife X1A 2L9
Contact person: Sheldon Nider
Telephone: 873-7702

Senior social workers in each community can be contacted to discuss the indicators, especially the first.

11.4 DISCUSSION

Social assistance records identify recipients by type: transient, first time, periodic, regular. The reason for assistance is given as: ill-health, dependent children, unemployed but able, not enough income, or other. "Unemployed" and "not enough income" can be grouped into the category "economic reasons". No record is kept of people refused social assistance but such refusals do not appear to present any problem at this time.

12. FAMILY LIFE

12.1 THE ISSUE

Of considerable concern as a possible cumulative impact is the gradual erosion of the quality of family life and extended family life that is characteristic of the Beaufort communities. The symptoms of this type of problem might include: child neglect and child welfare problems, less family care for the aged, and changes in traditional patterns of child-rearing.

It appears that child neglect, rather than child abuse, may be an increasing problem to be monitored in the communities. This may be related to difficulties of cultural transition, mental strain, and alcohol consumption. Young children playing unsupervised and unattended at all hours of the night is a visual indication of a possible problem which is of considerable concern to the communities where it occurs. An indicator of child welfare is suggested by the number of children coming into statutory care of social services, but this must be interpreted with extreme caution for the reasons suggested below.

There is also concern that the erosion of the extended family will reduce the traditional caring for the elderly in the communities. This is not a surprising trend as it mirrors what has happened in non-native western cultures. Nevertheless, it is not to be ignored as it reflects not only cultural change but requirements for the provision of social services for the elderly.

A recent sign of cultural alteration in family life may be changes in patterns of child-rearing. In Dene and Inuit cultures

children, and the bearing of children, are traditionally held in high esteem, with no stigma attached to unmarried motherhood. It is also traditionally the way in both Dene and Inuit cultures for child-rearing to be undertaken by grandparents/aunts/uncles as well as by parents, and for adoptions of children from one family to another to be readily undertaken. This pattern is reflected to this day in the "custom adoptions" sanctioned by the Social Services department, by which native families can arrange adoptions between themselves without reference to the lengthy non-native adoption process. There is now some evidence, however, of a preference by unmarried women for abortions rather than adoption - a matter of considerable concern to older native people.

There is also concern over the numbers of single parent families, especially female single parents (33% of all women with children in Aklavik, 25% in Fort McPherson and Arctic Red River [Jackson and Trudeau, 1983]). Single parenting may reflect family breakdown, but may also reflect the increasing social and economic independence of women from men. The numbers of single parents as a percentage of families with children should be monitored.

12.2 THE INDICATORS

Number of children coming into statutory care of social services (per community per year)

Number of social assistance recipients over 55 years of age (per community per year)

Forecast numbers of elderly persons for next five years (in the Inuvik region)

Average number of persons on the waiting list at the old people's homes in the region

Number of completions of custom adoptions (per community)

Number of abortions (by age of woman by community)

Single-Parent Families (as a percentage of families with children by community)

12.3 THE SOURCES

The first five above, excepting numbers of elderly:

Department of Social Services
GNWT
Yellowknife X1A 2L9
Contact person: Sheldon Nider
Telephone: 873-7702

The elderly forecasts and single parent families:

Bureau of Statistics
GNWT
Yellowknife X1A 2L9
Contact person: Nunda Rao
Telephone: 873-7653

Abortions:

Health and Welfare Canada
Medical Services Branch
Yellowknife X1A 2R3
Contact person: Kathy Praamsma
Telephone: 873-7041

12.4 DISCUSSION

The indicator "number of children in care" is a somewhat tenuous indicator of family breakdown at best. It may indicate a) family breakdown or b) more social workers available or c) harder-working social workers or d) lack of, or more, preventative family counselling or e) some combination of the

above. Neither preliminary counselling prior to care nor follow-up care is indicated. Finally, the Inuvik region of Social Services has a policy of not taking children into care if at all possible. At best then this is a measure of the statutory interaction between government and family in cases of necessity, and the involvement of government in the up-bringing of children.

Forecasts of the number of elderly in the region assume that permanent residents do not leave the NWT for retirement purposes.

13. HEALTH

13.1 THE ISSUES

The health of the total population of the region has steadily improved over the last two decades, and the health of Dene people has shown some dramatic improvements, especially in the area of infant mortality. For Inuit people health has also improved considerably, although some health indicators are still poor compared to the total population of the NWT. Certainly many of the causes of change in native health patterns lie beyond the reach of the medical delivery system itself, in changing social and cultural patterns. There is no doubt, however, that the range of medical and dental services offered in the region has increased dramatically over the time period and a brief report on that range of services would be a useful beginning to a consideration of health in a monitoring report.

Infant health statistics are one of the basic indicators of the quality of health around the world, and reflect not only the level of health care but of water quality, sanitation, nutrition, housing conditions, and pre-natal education. Infant birthweight is increasingly recognized as an indicator of subsequent infant health (Sterky and Millander, 1978). In 1981 the rate of low birthweight infants (under 2.5 kilograms) per 100 livebirths was 8.7 for native Indians and 8.1 for Inuit, compared with 3.7 for Health and Welfare's "other" category ("other" refers to non-native and Metis). Low birthweight should continue to be monitored for the region.

Infant mortality rates for Inuit babies in the NWT are

still the highest of any population group in Canada, although they have declined considerably over time. In 1981, for example, the rate of infant deaths for white and Metis was 11.2 per 100 livebirths, and for Inuit 37.5 per 100 for the whole of the NWT. Indian infant deaths declined dramatically between 1979 and 1981 - it remains to be seen if this is a trend. Monitoring of the infant mortality rates for each community would be useful.

A study by the Canadian Paediatric Society (1980) recently showed that Inuit children had an average of 14 different diseases in a year compared to 4 for the non-native child population. Number of visits of children per year to medical facilities would be a useful indicator. Related to this is a continued concern of medical personnel over low rates of breast-feeding in native communities. In studies in Inuvik this has been associated with infant diarrhea, recurrent respiratory infections, and chronic middle ear disease. Schafer et al.(1980) suggest early bottle feeding is "the most important cause for excess morbidity and mortality among Northern native infants." However, on the positive side, recent research (Shaefer and Spady, 1982) in Inuvik has shown a significant increase in rate and duration of breast-feeding between 1973 and 1979 in all three ethnic groups. The rate of infants still breast-fed at age six months increased from 21% to 44% for Inuit, 5% to 19% for Indians, and 5% to 38% for non- natives. The researchers found a corresponding inverse relationship between breast-feeding and hospitalization rates.

There are no regular annual statistics on rates of breast-feeding. However, Health and Welfare Canada is currently

mounting a cross-Canada study of breast-feeding patterns for every native baby born in 1983. This information will be available for each community by ethnic origin, and information on Metis people will be available separately. This information should be incorporated in subsequent monitoring reports, as should similar information as it becomes available.

For juveniles, mental health problems are the most serious. These are addressed in a separate section. Another issue is the amount of "junk food" replacing wholesome country food in both child and adult diets, which may contribute to Vitamin C and D deficiencies, dental caries, and loss of teeth. There are no good indicators of these problems, unless figures on per capita consumption of pop and candy for each community can be determined.

For adults, alcoholism is a serious health issue, and relates to crime and child neglect. It is addressed separately in a subsequent section. Related to alcoholism is the large number of deaths from violence, injury and accidents - the most common cause of death for all persons in the NWT, taken together. It is by far the most common cause of death among Inuit (41% in 1981), and the second most common cause for Indians (23%) and Metis and Whites (31%). These deaths constitute a most serious health issue and should be monitored.

In terms of disease, the native population is now showing marked incidence of the diseases of modern man. Schaefer et al. 1980 found that adult natives in Inuvik had a tenfold risk of gallbladder disease compared with corresponding groups in Arctic Bay. The main cause of death for NWT Indians is diseases of the

circulatory system, 31% in 1981, which also reflects their propensity to live longer and thus suffer these diseases. For Inuit circulatory diseases accounted for only 5% of deaths in 1981. The other disease group which should be monitored is cancer (neoplasm). Schaefer et al. (1975) found that the ratio of lung and uterine cervix cancer increased dramatically between 1950 and 1975 to become the dominant forms of Inuit cancer. Both may be explained by the increased urbanization of Inuit people over the period. The cause of death by type of disease should be monitored, as should life expectancy at age 1, which is a better overall measure of health than the crude death rate.

The incidence of diseases transmitted sexually, especially gonorrhea, has risen dramatically over the years. In 1981, the Canadian rate was 210 per 100,000 while the Indian and Inuit rate for the N.W.T. was 5,575 per 100,000. In that year there were 917 confirmed and unconfirmed cases in the Inuvik health zone. However, these diseases respond readily to treatment and have not been identified as a major issue in the region. The information is available and should be monitored if required.

It is likely that substantial improvements in some areas of health could come with improved environmental (water, sewage, food storage) arrangements. The frequent incidence of shigellosis and gastro-enteritis should be monitored.

Related to the provision of health services, the clearest issue has to do with staff turnover in the Inuvik zone, which for fiscal year 1981/82 was 47.6%. This means that patients rarely see the same doctor in the hospital and that nurses come and go at nursing stations (with some notable exceptions). For

all residents of the region this is obviously a frustrating experience and should be monitored. While not unique to the health service, the situation seems most exaggerated there. Also of related concern is the number of health service positions left vacant for long periods of time.

Another issue is the low number of native people working in the health system, which can be contrasted with the relative success of GNWT Social Services in hiring native people as community social workers. Another clear concern is the lack of decentralization of authority in the health system to the regional level. There is no ready indicator of this issue but it should not be ignored.

Finally, utilization rates of hospital and nursing stations are useful as a broad measure of the level of resident/health system interaction over time, as are any waiting lists or medivacs due to overcrowded facilities in the Inuvik hospital.

13.2 THE INDICATORS

Report on range of medical and dental services in the region

Low birthweight infants - rate per 100 livebirths (for the region by ethnic origin)

Infant mortality rate per 1000 livebirths (for the region by ethnic origin)

Life expectancy at age 1 (by ethnic origin)

Cause of death by: accidents, injury and violence
diseases of the circulatory system
neoplasma
gallbladder disease
(by zone, community, age, ethnicity).

Reported cases of shigellosis
Reported cases of unspecified gastro-enteritis
Incidence of confirmed cases of gonorrhea

(by zone, community, ethnic region)

HWC staff turnover rate

HWC staff positions vacant over two months (by time period of vacancy)

Percentage of native HWC staff in region

Inpatient days (per facility by age)

Outpatient visits (per facility by age)

Number of medivacs (per year, origin and destination, reason)

13.3 THE SOURCES

All indicators except life expectancy

Health Management Information System (HMIS)
Medical Services Branch
Health and Welfare Canada
Yellowknife X1A 2R3
Contact persons: Kathy Praamsma, Kathy Kowerchuk, Lise Picard (breastfeeding research program)
Telephone: 873-7041

Life expectancy information (1984 onwards):

Bureau of Statistics
GNWT
Yellowknife X1A 2L9
Contact person: Nunda Rao
Telephone: 873-7653

13.4 DISCUSSION

It is important to remember that the recorded incidence of health problems generally requires that people voluntarily turn up for treatment, and that quite commonly the increased incidence of identified pathology may reflect an increased level of health service.

The infant mortality rate includes perinatal, neonatal, and post neonatal deaths, that is, all infant deaths to one year of age excluding stillbirths. Because of low numbers these rates must be interpreted with caution. Statistics for low birthweight infants do not distinguish between premature and full term babies.

With only about 40 deaths per year in the region, the figures for "cause of death" can fluctuate considerably from year to year. This fluctuation may have no long-term significance and should be treated most cautiously.

Three broad population groups are used in statistical analysis by Health and Welfare Canada: Registered Indians, Inuit and Other. "Other" includes both Metis and non-natives, except in the case of the breast-feeding research program, as noted in the text.

The turnover rate for HWC staff refers to the number of terminations from the zone as a percentage of the number of employees.

14. ALCOHOL-RELATED SOCIAL PROBLEMS

14.1 THE ISSUE

There is no doubt that many social problems in the region are alcohol-related. Schaefer et al. (1980) suggest that alcohol-related deaths and disorders have reached epidemic proportions, and that 40% of native men in Inuvik had a history of alcoholism leading to serious physical, legal or social consequences. The RCMP 1982 Annual Report for the NWT states "the prime factor for most serious crimes is liquor". Drinking plays a significant role in family breakdown, child neglect, and accidental deaths. Alcohol-related problems are of significant concern to native communities, Health and Welfare Canada, GNWT Social Services and the RCMP. Excessive drinking is an obvious manifestation of tensions in these transitional communities, and results in significant cumulative impact on family life, public safety, and social service provision.

Information on community responses to alcohol-related problems could also be reported. This might include information on the number of times that each community has held a liquor plebiscite, the number of communities with alcohol counselling programs, the budget or funding made available on a community basis for such programs, and (for other communities in the NWT that have tried such measures) the controls that have been put in place at the local level to limit the sale of alcohol.

14.2 THE INDICATORS

One of two currently valid indicators of alcohol-related problems is the level of consumption itself, based on sales from the Inuvik Liquor Store:

> Value of liquor sales from the Inuvik Liquor Store (in constant dollars)

A second is:

> Deaths related to alcohol and violence in Inuvik General Hospital

Also, this has been suggested:

> Brief report on community responses to alcohol-related problems

Last, beginning in 1983, the RCMP will be identifying all crimes in which liquor is involved. This information may prove useful, and will be available beginning summer 1984.

14.3 THE SOURCES

GNWT Liquor Control Board
Annual Report
Hay River

Health Management Information System
Medical Services Branch
Health and Welfare Canada
Yellowknife X1A 2R3
Contact person: Kathy Praamsma
Telephone: 873-7041

Operational Statistics Reporting System
RCMP "G" Division
Yellowknife X1A 2R3
Contact person: Cpl. R.G.J. Lamabe
Telephone: 920-8332

14.4 DISCUSSION

The Inuvik Liquor Store serves all the Beaufort region communities with the exception of Coppermine, which is served by air shipments from the Territorial Liquor Store in Yellowknife. From 1973-1977 beer (only) was sold in Fort McPherson.

A good discussion of the difficulty of interpreting liquor consumption statistics may be found in Dome et al., 1983 (Beaufort-Delta Zone pp. 28-30). The problems include the fact that the Inuvik store caters to transients as well as residents of the region. On the other hand, there is evidence that residents also bring alcohol in from Yellowknife and Edmonton, so it might be assumed that there is some balancing in the two factors.

Constant dollars (1972) are used to even the differential effects of price increases in alcohol over time where our concern is consumption rather than dollar amounts consumed. 1972 is a base year used repeatedly (eg. Dome et al., 1983).

Per capita dollar consumption figures can also be derived by dividing annual consumption figures by regional population, on the understanding that the effects of transients' consumption and resident sources outside of Inuvik may alter the figures somewhat. Nevertheless, in terms of cumulative social change, the per capita consumption (in constant dollars) has increased dramatically (1960-61: $112; 1981-82: $338).

Interpretation of RCMP "alcohol-related" crime statistics will be undertaken with some caution, given the possibility of police officer discretion. Nevertheless, the figures are likely to be as dramatic as the consumption figures.

15. JUVENILE MENTAL HEALTH AND SUICIDE

15.1 THE ISSUES

Young adults (15-24 years of age) of the current generation may be amongst the groups least able to cope with a northern society in rapid transition. A good education, to a non-native standard, in the residential school in Inuvik may leave them unprepared for the more traditional lifestyle in their home communities. And yet they are often unwilling to leave those communities for a wage employment-based lifestyle elsewhere. The problem is especially critical for young people who have dropped out of school, but are too young to take advantage of rotational work schemes. The result may be boredom, drinking and/or glue and gas sniffing, and crime. Of the nine suicides in the NWT in 1981, eight were under 24 years of age. A recent (1983) spate of suicides and suicide-attempts in the Inuvik Region overall (fifteen suicides), and especially in Tuktoyaktuk and in Fort McPherson re-emphasizes this tragic problem. The dramatic importance of this indicator of social tension need not be elaborated.

With regard to this, it might be useful to identify the number of youth groups that are available for young people to participate in and the types of counselling and crisis telephone lines that are available at the community and regional level.

15.2 THE INDICATORS

Number of suicides (by age per community)

Number of unsuccessful suicide-attempts (by age by community)

Brief report on youth groups and youth counselling programs (by community)

15.3 THE SOURCES

Suicide Register
Medical Services Branch
Health and Welfare Canada
Yellowknife X1A 2R3
Contact person: Kathy Praamsma
Telephone: 873-7041

Department of Social Services
GNWT
Inuvik X0E 0T0
Contact person: Paul Donnelly, Regional Superintendent
Telephone: 979-7222

15.4 DISCUSSION

Two brief comments can be made with respect to these indicators. First, it should be noted that individuals who attempt to kill themselves and subsequently die in a hospital (say in Inuvik or Yellowknife) are not always reported as a suicide in terms of their home community. They often show up as a "death by suicide" in the hospital community's statistics, which may be as distant as Edmonton. A second cautionary note is that information on unsuccessful suicide attempts is extremely difficult to obtain. Medical personnel and family members are often reluctant to describe a situation as an attempted suicide rather than an accident (ref. Greenall, 1984).

16. PUBLIC SAFETY

16.1 THE ISSUE

A concern which the Beaufort region communities share with similar rural communities everywhere is that increasing industrialization will be associated with higher ratio of anti-social behaviour and more conflict with the law.

16.2 THE INDICATORS

Criminal code reported offences against persons
Criminal code reported offences against property (by total offences and per unit population for the Beaufort region and for each appropriate RCMP detachment)
Number of police posted to the region

16.3 THE SOURCE

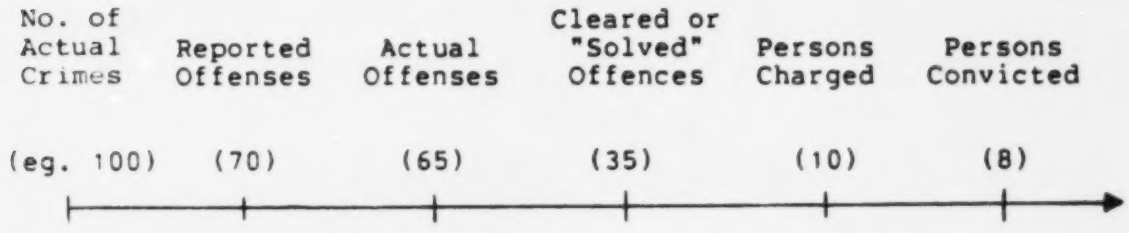
Operational Statistics Reporting System
RCMP "G" Division
Yellowknife X1A 2R3
Contact person: Cpl. R.G.J. (Ron) Lamabe
Telephone: 920-8332

16.4 DISCUSSION

The main problem in using criminal justice statistics for monitoring is that the statistics are very sensitive to what can be called "human discretion" - in this case on the part of the police and judges. Different police officers have different crime reporting and charging practices and these can greatly influence statistical crime rates - especially where populations are low as in the Beaufort region. For example, one policeman who witnesses a fight may decide to arrest the persons involved,

another may send them on their way with a warning. The indicators selected above are least influenced by discretion for a number of reasons.

To understand these reasons it is helpful to envision the criminal justice system in a manner suggested by S/Sgt. Jim Scott of "G" Division:



Not all actual crimes are reported - only 70% in our example. Most, but not all, reported crimes actually took place. Only some actual crimes are "solved" (35%), and even fewer people are formally charged, while the rest are diverted to government or nongovernment-sponsored diversionary programs. Even fewer are convicted (8%) and of those some will be on probation and some will go to prison. Statistics can be selected from any point on this continuum and it is obvious that the crime rate will appear quite different depending on the point selected. The RCMP suggest the effect of discretion is minimized at the point of "reported offences", because after that point the particular practice of individual police officers takes over, and the statistics become "police influenced".

The laws which the police enforce are based on four sources: criminal code, and federal, territorial and municipal statutes. The main federal statutes are concerned with drugs,

and the majority of offences under territorial statutes involve violations of the Liquor Act and the detention of intoxicated persons. Interesting as drug and alcohol offences may be - they are notoriously sensitive to discretion. An undercover drug operation can send the drug offence rates soaring in one year, and render annual comparisons virtually meaningless. A policy to keep the jails free by ignoring drunks will send these rates down. The only offences which are relatively free from police influence are criminal code offences against persons and property, at the reporting stage, because the reports come from the community rather than being generated by police activity.

In addition, there is a strong argument for taking all criminal code person and property offences rather than just some, to smooth out the variations which may be caused by small populations in the communities. Finally the relevance of "reported offences" in relation to changes in numbers of probationers and parolees is borne out in a GNWT Social Services report on Tuktoyaktuk, which notes an increase in the number of probationers/parolees proportional to reported offences (Nagora, 1983). It would appear that the indicators selected are the most appropriate given the limitations discussed here.

Geographically, included in the Inuvik RCMP sub-division are the following detachments for which statistics are available individually:

Sachs Harbour

Tuktoyaktuk (includes Paulatuk)

Inuvik

Aklavik

Fort McPherson (includes Arctic Red River)

17. HOUSING

17.1 THE ISSUES

In the late 1950s the government began to supply low-rental houses to replace snow houses, tents, sod-houses and shacks. Thirty years later about 90% of the housing in the region is rented, and about 80% is rented from a governmental agency. In Inuvik, for example, 46% of the housing units belong to the Federal Government, 14% to the GNWT and 19% to the Northwest Territories Housing Corporation (NWTHC). In other communities the majority of the housing units belong to the NTHC. In Tuk, for example, 119 units are rented from NTHC, in Aklavik the number is 146. These units are administered by the boards of directors of local housing associations in each community, under a management agreement with the NWTHC. In addition to its rental program, the NWTHC offers a homeownership assistance program which provides a forgivable interest-free loan for building materials, and a CMHC cost-shared subsidized mortgage program.

Housing issues focus on a shortage of suitable accommodation, related overcrowding of existing dwellings, and on the disparity of housing quality between native and non-native housing. Many sources: native, municipal, and NTHC alike; recognize a housing shortage in the communities in that reasonable demand exceeds the supply of new and/or renovated suitable dwellings. This is reflected in the fact that vacant, and available, accommodation in Inuvik is about nil, and in the extensive Housing Association waiting lists in other communities. For all communities the NWTHC keeps track of the

levels of housing shortage by assessing the supply of housing and its condition, and matching this with the requirement for housing, given family size. This gives a waiting list for housing ordered according to the need of the families on the list, and to the number of bedrooms required. This provides a useful measure of housing status for all communities except those in which a private market exists such as Inuvik. In the future, this assessment system will be adjusted to take into account demographic factors such as family size, proportion of teenagers about to enter the housing market, and the decline of the extended family under one roof. A similar housing list exists for the Inuvik Housing Association, but because of the much lower proportion of NTHC housing, should be supplemented with information provided by the Town of Inuvik.

There is no doubt that overcrowding exists, either because more than one family or an extended family lives in one housing unit. Common indicators of overcrowding include the number of persons per bedroom, or number of square meters of housing per person. The NTHC waiting list does contain information on number of occupants per unit, number of bedrooms, and the area, and in the future this information could be combined to give some measure of overcrowding in NWTHC dwellings. However, the discussion below suggests why this may not be entirely useful.

Another issue concerns the disparity between the quality of native and non-native housing. Substandard housing is almost always occupied by native tenants. The NWTHC maintains a "housing unit condition report" on each of its properties and is attempting, given financial constraints, to rehabilitate all

sub-standard dwellings over time (132 in 1981). Non-native housing, often provided for non-local people, is much more likely to be provided with utilidors or septic tanks and piped water, while natives rely on the "honey-bag" system, and go without piped utilities. Native people would like all housing to be provided with a similar level of water and sewage facilities. This information is collected periodically by the GNWT Department of Local Government. Its use has already been included in section 3.0.

A final issue concerns the overall dependency of native people on government rental housing and the implied lack of independence and self-control. Native people are concerned that non-native residents enjoy much higher standards of housing and this does not contribute to self-esteem (ITC News, 1980). To counter this, the NWTHC and the CMHC, in conjunction with native organizations, are encouraging home ownership. The proportion of rented to owned dwellings can easily be monitored. However, government subsidy of heating and electricity in rental accommodation may weigh strongly against home ownership.

This suggests a final point. That is that high subsidy levels for northern housing may foster a lack of interest in occupier maintenance and energy economy. A related problem is that of unpaid rents on subsidized housing. Each of these points may serve to limit the quantity of funds available to upgrade the housing stock in the region.

17.2 THE INDICATORS

Housing status (surplus or deficiency per number of bedroomed units per community)

Percentage units substandard by condition rating (per community)

NWTHC costs and revenues (on a per unit or unit type basis)

17.3 THE SOURCES

Northwest Territories Housing Corporation
P.O. Box 2100
Yellowknife X1A 2P6
Contact person: Hal Logsden
Telephone: 873-7853

Town of Inuvik
Inuvik
Contact person: Tom Detlor
Telephone: 979-2607

17.4 DISCUSSION

With regard to overcrowding, it has been suggested (Town of Inuvik, 1982) that what numbers exist are underestimated. This is so because people fear that if they correctly report overcrowded conditions they will suffer either rent increases or eviction. In any event, the NWTHC housing status index does already take into account what information is collected on overcrowding, so it may be redundant to attempt to forge a separate indicator for this data.

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